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ABSTRACT

This module was designed to allow students to build or increase their level of understanding of geometry. It helps students develop those skills necessary to successfully understand and use basic geometry skills that are necessary for many vocational jobs and that act as a basis for additional understanding. The seven units include: (1) "Geometric Figures"; (2) "Perimeters in Geometry"; (3) "Geometric Areas"; (4) "Circumference and Area of Circles"; (5) "Volume"; (6) "Geometric Angles"; and (7) "Reviewing Geometry." Each unit includes performance objectives; suggested activities; pretests; information, assignment, and job sheets; tests; and answer sheets. (YP)

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MATHEMATICS SERIES
Principles, Concepts and Applications

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GEOMETRY

SE 050 879

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GEOMETRY

Developed by the
Curriculum and Instructional Materials Center
Oklahoma State Department of Vocational and Technical Education

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GEOMETRY

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FOREWORD

The *General Mathematics* series is intended to help students become more competent with basic mathematics. The student will be introduced to the basic mathematic principles and concepts as well as have the opportunity to apply those principles and concepts. The series contains six (6) modules ranging from *Whole Numbers* to *Measurement* to *Consumer Math* (which includes managing income and basic microcomputer awareness). Each module takes the students through the important areas within the subject matter to ensure a basic working knowledge and skills.

The *Geometry* module will allow students to build or increase their level of understanding of geometry. This module helps students develop those skills necessary to successfully understand and use basic geometry skills that are necessary for many vocational jobs and that act as a basis for additional understanding.

Roy Peters, Jr., Director
Oklahoma State Department of
Vocational and Technical Education

ACKNOWLEDGEMENTS

The development of the *General Mathematics: Geometry* module is credited to the staff of the Oklahoma State Department of Vocational and Technical Education (SDVTE) and various individuals.

A very special thanks goes out to the staff members of the Curriculum and Instructional Materials Center (CIMC). Sheila Stone, Coordinator of Curriculum Development, provided the support and encouragement necessary to successfully develop the series. Dr. Clyde Matthews, past Coordinator of Special Programs, gave his support during the production, and Billie Frazier, Vocational Specialist, provided assistance during the committee validation meetings.

Special thanks goes to the committee members:

Dirk Allen — Harrah High School
Jan Bull — Mangum High School
Kathy Cloud — Rush Springs High School
Margaret Spann — Lindsey High School
Tod Williams — Newcastle High School

A very special thank-you also goes to Dirk Allen's students for developing many of the games used throughout the series.

The CIMC would also like to extend a great appreciation to Kaye White, Technical Writer, for her assistance in developing the *Geometry* module.

Throughout the development process, the communications center played an important part. Therefore, a special appreciation is extended to Rose Primeaux, Manager, and typist Lisa Tomlinson.

Terrell B. Ogilvie,
Technical Writer
Curriculum and Instructional
Materials Center

OTHER MODULES IN THE *GENERAL MATHEMATICS* SERIES

WHOLE NUMBERS

DECIMALS AND PERCENTS

MEASUREMENTS

FRACTIONS

CONSUMER MATH

Instructional Units

Geometry contains seven instructional units. A standard format was established in 1970 for development of instructional materials for all Oklahoma vocational teachers. This format includes basic components that form a unit of instruction: performance objectives, suggested activities, pretest, information sheet, assignment sheets, job sheets, transparency masters and supplements, tests, and answers to tests, pretests, and assignment sheets. Depending on the specific objectives, there may or may not be transparency masters, supplements, assignment sheets, or job sheets included in the unit of instruction.

All of the unit components "zero in" on measurable and observable learning outcomes. Teachers are encouraged to supplement, personalize, localize, and motivate with these materials in order to develop a complete teaching/learning process.

Units of instruction are designed for use in more than one lesson or class period of instruction. Careful study of each unit of instruction by the teacher will help him or her determine the following

A. Amount of material that can be covered in each class period
B. Skills that must be demonstrated
    1. Supplies and equipment needed
    2. Amount of practice needed
    3. Amount of class time needed for demonstrations
C. Supplementary materials, such as pamphlets and filmstrips, that must be ordered
D. Resource people to contact

Performance Objectives (white pages)

Each unit of instruction is based on the performance needed for successful employment in an occupational area. Performance objectives are stated in two forms: unit objectives, stating the subject matter to be covered in a unit of instruction; and specific objectives, stating the performance necessary to reach the unit objective.

Since the objectives of the unit provide direction for the teaching/learning process, it is important that instructors and students have a common understanding of the intent of the objectives. Following is a list of performance terms, their meanings, and behavioral synonyms that may have been used in this material.

A. Name — The individual supplies a name for objects, events, or people

    Behavioral synonyms: Label, list, letter, record, reiterate, repeat, write

B. Identify — The individual selects a named, described, or pictured object by pointing to it, touching it, picking it up, or selecting it

    Behavioral synonyms: Select, mark, match, choose, judge

C. State a rule — The individual communicates a relationship or principle that could be used to solve problems or perform a task

D. Apply a rule — The individual supplies an answer to a problem by using a stated relationship or principle

   Behavioral synonyms: Solve, calculate

E. Describe — The individual relates sufficient characteristics or properties of an object or event so that a second individual will be able to state what is being discussed

   Behavioral synonyms: Define, discuss, interpret, recite, tell how, tell what happens when

F. Distinguish — The individual selects an object or event from two or more that are easily confused

   Behavioral synonyms: Discriminate, differentiate

G. Order — The individual arranges three or more objects or events in a sequence based on a stated property

   Behavioral synonyms: Arrange, sequence, list in order, classify, divide, isolate, sort

H. Construct — The individual makes a physical object, a verbal statement, or a drawing

   (NOTE: *Construct* is used when the finished product or result is important.)

   Behavioral synonyms: Draw, make, build, design, formulate, reproduce, transcribe, convert, put together, compile

I. Demonstrate — The individual performs several operations necessary to carry out a specified process

   (NOTE: *Demonstrate* is used when it is desirable to watch the student perform a task, one of the highest levels of student performance.)

   Behavioral synonyms: Show your work, show procedure, perform an experiment, perform the steps, operate, remove, replace, turn off/on, (dis)assemble, (dis)connect

The objectives should be provided for students and stressed throughout the teaching/learning process. This will help answer any questions concerning performance requirements for each instructional unit. The objectives can also help determine teaching strategies and instructional methods. Prepare for each unit by deciding how each objective can best be taught.

The objective sheet may also be used as a quick pretest to determine prior knowledge of students and to determine whether further study or activities are necessary. Instructors should feel free to modify, delete, or add objectives in order to meet the needs of the students and community. When changes in objectives are made, the instructor should remember to supply the needed information, assignment and/or job sheets, and criterion test items.

Suggested Activities (pink pages)

This component is included only in instructor material. The suggested activities page assists the instructor during the preparation stage of the teaching/learning process by providing suggestions for delivery and/or presentation during the instructional process. Read the suggested activities before teaching the units to allow time to obtain supplemental materials, prepare audio-visual materials, and contact outside resources. Duties of the instructor will vary according to the particular unit.

The references that are listed are ones used in the development of each unit. They should be used by the instructor to supplement her or his knowledge of the subject area or to help students with particular interests or occupational objectives in the area covered.

Pretest (white pages)

This component provides a pre-assessment of the knowledge that a student possesses prior to instruction. In individualized instruction, a student may challenge out of studying some or all of the cognitive objectives. In a group instructional setting, instructors may evaluate the knowledge that a group of students bring with them and determine where instruction should be emphasized.

Supplements (white pages)

Supplements are additional teaching aids that support portions of the information sheet. Supplements include such activities as games, puzzles and additional information. Supplements may be photo-copied for classroom use only.

Transparency Masters (white pages)

Transparency masters provide information in a special way. Transparencies direct the class's attention to the topic of discussion. Transparencies may present new information, or they may reinforce information presented in the information sheet. They are particularly effective when identification is necessary. Make transparencies and place them in the notebook where they will be immediately available for use.

Information Sheet (green pages)

The information sheet provides "must know" content essential for meeting the cognitive (knowledge level) objectives of the unit. The information is written in an outline form and is keyed to the specific objectives.

Instructors will find the information sheet serves as an excellent guide for presenting background knowledge necessary to develop the skills specified in the unit objective. The information sheet may also be used for coordination activities and advisory committees.

Students should read the information sheet before the information is discussed in class. Space is provided in margins for students and instructors to add notes that supplement, localize, personalize, or provide motivation for each unit.

Assignment Sheets (brown pages)

Assignment sheets give students a chance at problem solving, self-assessment, and/or practical experience with the information. They assist students in the application of knowledge that is a necessary prerequisite to skill development. These may be given to the student for completion in class or used for homework assignments. Answer sheets are provided when appropriate and can be used by the student and/or instructor for checking student progress.

Job Sheets (blue pages)

Job sheets are another important segment of a unit of instruction. The job sheets provide a list of equipment, tools, and materials needed to complete a manipulative or psychomotor skill. They describe a step-by-step procedure needed to complete each task or job. Diagrams, photographs, and illustrations are provided to assist students in achieving the skill.

Instructor should demonstrate to students the procedure outlined in each job sheet. Furthermore, the instructor needs to localize the job sheet according to the equipment and supplies available in the local lab or shop situation. Job sheets also furnish potential employers with a picture of the skills being taught and the performances they might reasonably expect from a person who has had this vocational instruction.

Test (white pages)

This component provides criterion-referenced evaluation of every objective listed in the unit of instruction. It is crucial to note that both paper/pencil and performance objectives must be evaluated.

The tests may be written or oral. It is recommended that the tests be divided into shorter tests covering three or four objectives at a time and given soon after those objectives have been covered. A selection of questions from the units covered may be used for final tests at the end of each term if desired. If objectives have been added, deleted, or modified, be sure to make the changes on the test.

The acceptable response on a unit test, 85 percent in most units, may be raised or lowered to fit the topic or students' ability levels. The percentage applies to the overall score, not to each individual question. The final unit grade should be obtained by using the paper/pencil score along with evaluations of student's demonstrations of the desired skills. The tests are in the instructor's book only but may be photo-copied for classroom use only.

Answers to Pretest, Answers to Test, and Answers to Assignment Sheets (pink pages)

These components are designed to assist the instructor in evaluation of student performances.

Teaching Methods

It is a challenge to keep students motivated. Supplement the objectives by providing the "why," personal experiences, and current information. Prepare for each unit by deciding how each objective can best be taught. Allow students to become involved in preparing and planning.

Corrections and Suggestions

The Curriculum and Instructional Materials Center (CIMC) wants to provide vocational instructors and students with materials that are accurate and effective. Although the CIMC strives to maintain the highest standards of development and production, oversights occasionally do occur. If you find any errors in this or other CIMC publications, or have suggestions for improving their usefulness in vocational programs, please notify the CIMC staff. One easy way of pointing out errors is to make a photocopy of the affected pages and to indicate the correction on the copy. You can then mail the information to the CIMC, where it will be used to correct the publication before the materials are reprinted.

To ensure that the material is updated on a timely basis, it is important that you notify the CIMC of necessary corrections as soon as possible after discoving the error. Do not assume that someone else will notice the error and inform us; other users may be making the same assumption. Please send corrections and recommendations for improving this publication to the following address:

Coordinator of Curriculum Development
Curriculum and Instructional Materials Center
Oklahoma State Department of Vocational and
Technical Education
1500 West Seventh Avenue
Stillwater, Oklahoma 74074-4364

GEOMETRIC FIGURES
UNIT I

UNIT OBJECTIVE

After completing this unit, the student should be able to define terms related to geometric figures and identify the common geometric shapes. This knowledge will be evidenced by completing assignment sheets and unit test with a minimum score of 85 percent.

SPECIFIC OBJECTIVES

After completing this unit, the student should be able to

1. Define terms related to geometric figures.
2. Identify drawings of geometric figures.

GEOMETRIC FIGURES
UNIT I

SUGGESTED ACTIVITIES

I. Unit contents

A. Objective sheet

B. Suggested activities

C. Pretest

D. Answers to pretest

E. Information sheet

F. Assignment Sheet #1 — Geometric Shapes

G. Answers to Assignment Sheet #1

H. Test

I. Answers to test

II. Instructor's guide

A. Order (or obtain) materials to supplement unit.

B. Discuss unit and specific objectives.

- Explain that this unit begins the study of geometry by introducing students to the various geometric forms they will be working with now and in later units.

- Ask students to identify any geometric shapes they are already familiar with. Ask students to go to the chalkboard and draw any shapes they identify.

C. Discuss information and assignment sheets.

1. Review terms and definitions related to geometric figures using Information Sheet, Section I.

2. Introduce drawings of geometric figures using Information Sheet, Section II.

- Relate the drawings in Section II to the definitions in Section I.

- Have students go to the board and practice drawing the various geometric figures as you call them out.

SUGGESTED ACTIVITIES

D. Give test.

E. Critique test and discuss in class.

F. Reteach and retest as necessary.

III. Unit reference — Spann, Margaret. *Vocational Related Math*. Stillwater, Oklahoma: State Department of Vocational and Technical Education/Curriculum and Instructional Materials Center, 1972.

GEOMETRIC FIGURES
UNIT I

PRETEST

NAME _____ SCORE _____

1. Define the following terms related to geometric figures.

   a. Circle _____

   _____

   _____

   b. Square _____

   _____

   _____

   c. Triangle _____

   _____

   _____

   d. Rectangle _____

   _____

   _____

   e. Rhombus _____

   _____

   _____

   f. Parallelogram _____

   _____

   _____

   g. Trapezoid _____

   _____

   _____

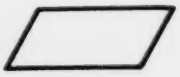
PRETEST

2. Identify the following geometric figures.

a. _____

b. _____

c. _____



d. _____

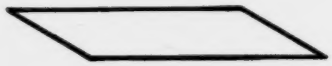
e. _____

f. _____

PRETEST

g. _____

h. _____



i. _____

GEOMETRIC FIGURES
UNIT I

ANSWERS TO PRETEST

1. a. A flat round figure formed by one curved line which joins into a ring shape; all points of the curved line are equal distance from the center
   b. A figure having four equal sides and four right angles
   c. A figure having three sides and three angles
   d. A four-sided figure with two parallel and equal ends, two parallel and equal sides, and four right angles
   e. A figure having four sides of equal length
   f. A four-sided figure with two parallel ends of equal length and two parallel sides of equal length
   g. A four-sided figure with only one pair of opposite sides parallel

2. a. Circle
   b. Rectangle
   c. Parallelogram
   d. Triangle
   e. Square
   f. Rhombus
   g. Trapezoid
   h. Parallelogram
   i. Rectangle

GEOMETRIC FIGURES
UNIT I

INFORMATION SHEET

I. Terms and definitions

A. Geometric figures — Closed shapes formed by straight or curved lines

B. Square — A figure having four sides of equal length and four right angles

C. Rhombus — A figure having four sides of equal length

D. Rectangle — Four-sided figure with two parallel ends of equal length and two parallel sides of equal length and four right angles

E. Trapezoid — A four-sided figure with only one pair of opposite sides parallel

F. Triangle — Figure having three sides and three angles

G. Circle — A flat round figure formed by one curved line which joins into a ring shape; all points of the curved line are equal distance from the center

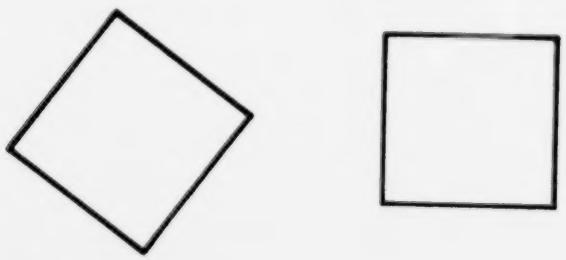
H. Parallelogram — A four-sided figure with two parallel ends of equal length and two parallel sides of equal length

II. Drawings of geometric figures

A. Square

(NOTE: A square is a rhombus with four right angles.)

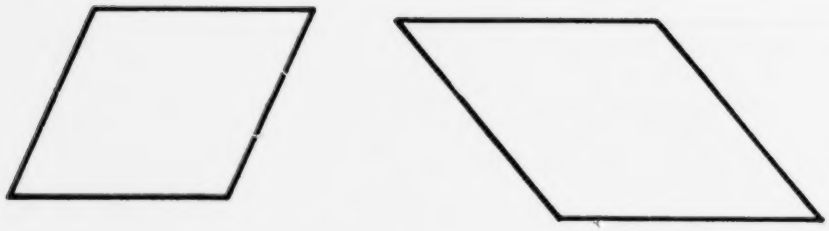
FIGURE 1



INFORMATION SHEET

B. Rhombus

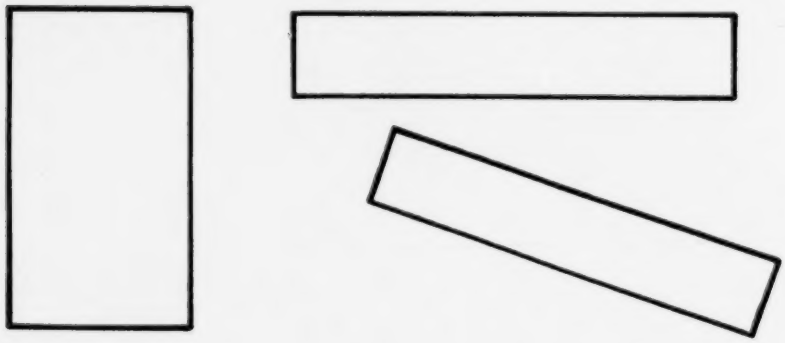
FIGURE 2



C. Rectangle

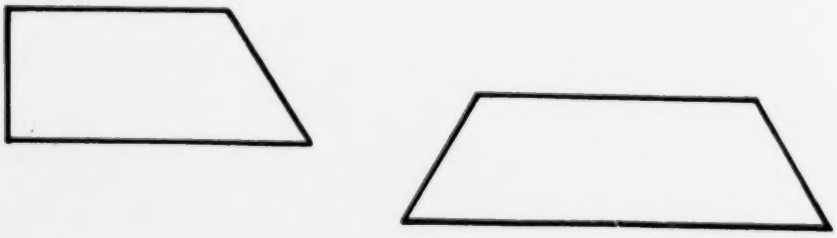
(NOTE: A rectangle is a parallelogram with four right angles.)

FIGURE 3



D. Trapezoid

FIGURE 4



INFORMATION SHEET

E. Triangle

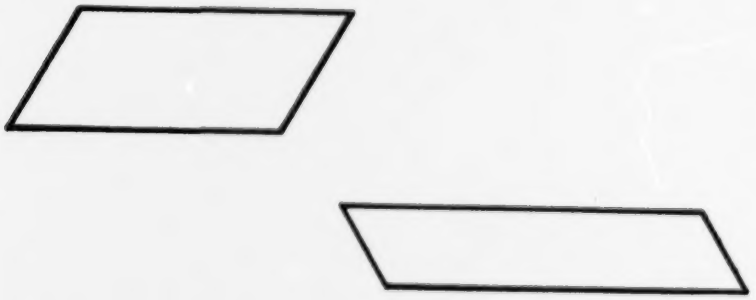
FIGURE 5

F. Circle

FIGURE 6

G. Parallelogram

FIGURE 7



GEOMETRIC FIGURES
UNIT I

ASSIGNMENT SHEET #1 — GEOMETRIC SHAPES

NAME _____ SCORE _____

1. Name three things in your classroom that are shaped like a rectangle.

   a. _____

   b. _____

   c. _____

2. Name three things in your classroom that are shaped like a square.

   a. _____

   b. _____

   c. _____

3. Name three things in your classroom that are shaped like a circle.

   a. _____

   b. _____

   c. _____

4. Name three things in your classroom that are shaped like a triangle.

   a. _____

   b. _____

   c. _____

5. Write "Yes" or "No" after the following statements.

   a. A triangle has four sides. _____

   b. A square has four equal sides. _____

   c. A circle has three sides. _____

   d. A square is round. _____

   e. A triangle has three sides. _____

ASSIGNMENT SHEET #1

f. A rectangle is the same as a triangle. _____

g. A rhombus and a square are the same. _____

h. A trapezoid has four sides. _____

GEOMETRIC FIGURES
UNIT I

ANSWERS TO ASSIGNMENT SHEET #1

1. Evaluated to the satisfaction of the instructor.

2. Evaluated to the satisfaction of the instructor.

3. Evaluated to the satisfaction of the instructor.

4. Evaluated to the satisfaction of the instructor.

5. a. No
   b. Yes
   c. No
   d. No
   e. Yes
   f. No
   g. No
   h. Yes

GEOMETRIC FIGURES
UNIT I

TEST

NAME _____ SCORE _____

1. Define the following terms related to geometric figures.

   a. Circle — _____

   b. Square — _____

   c. Triangle — _____

   d. Rectangle — _____

   e. Rhombus — _____

   f. Parallelogram — _____

   g. Trapezoid — _____

TEST

2. Identify the following geometric figures.

a. _____

b. _____

c. _____

d. _____

e. _____

f. _____

g. _____

h. _____

i. _____

GEOMETRIC FIGURES
UNIT I

ANSWERS TO TEST

ANSWERS TO TEST

1. a. A flat round figure formed by one curved line which joins into a ring shape; all points of the curved line are equal distance from the center
   b. A figure having four equal sides and four right angles
   c. A figure having three sides and three angles
   d. A four-sided figure with two parallel and equal ends, two parallel and equal sides, and four right angles
   e. A figure having four sides of equal length
   f. A four-sided figure with two parallel ends of equal length and two parallel sides of equal length
   g. A four-sided figure with only one pair of opposite sides parallel

2. a. Triangle
   b. Rhombus
   c. Rectangle
   d. Triangle
   e. Rectangle
   f. Square
   g. Parallelogram
   h. Circle
   i. Trapezoid

PERIMETERS IN GEOMETRY
UNIT II

UNIT OBJECTIVE

Upon completing this unit, the student should be able to define perimeter. The student should be able to calculate and write the formula for figuring the perimeter for a rectangle, a square, and a triangle. This knowledge will be evidenced by completing assignment sheets and unit test with a minimum score of 85 percent.

SPECIFIC OBJECTIVES

After completing this unit, the student should be able to

1. Define perimeter.
2. Write the formulas for calculating the perimeter of a rectangle, a square, and a triangle
3. Calculate the perimeters of rectangles, squares, and triangles.

PERIMETERS IN GEOMETRY
UNIT II

SUGGESTED ACTIVITIES

I. Unit contents

A. Objective sheet

B. Suggested activities

C. Pretest

D. Answers to pretest

E. Information sheet

F. Assignment sheets

1. Assignment Sheet #1 — Calculate Perimeters of Rectangles

2. Assignment Sheet #2 -- Calculate Perimeters of Squares

3. Assignment Sheet #3 — Calculate Perimeters of Triangles

G. Answers to assignment sheets

H. Test

I. Answers to test

II. Instructor's guide

A. Order (or obtain) materials to supplement unit.

B. Give pretest.

C. Critique pretest and go over results in class.

(NOTE: Be sure to take up pretests after discussing them in class. Students who score 85 percent or higher on the pretest do not need to study this unit.)

D. Discuss unit and specific objectives.

- Explain that in this unit students will learn how to calculate the distance around the edge of a flat figure. Give some examples of figures with which students are familiar.

- Write an example on the board, and explain what the perimeter is.

SUGGESTED ACTIVITIES

E. Discuss information and assignment sheets.

1. Review the definition of perimeter using Information Sheet, Section I.

2. Introduce the formulas for determining perimeters of rectangles, squares, and triangles; use Information Sheet, Section II.

   - Write the formulas on the board, and draw a figure on the board to accompany each of the formulas.

3. Explain how to calculate the perimeters of rectangles, squares, and triangles; use Information Sheet, Section III.

   - To the figures on the board, add numbers to use for examples in calculating the perimeters.
   - Have students take notes.
   - Give students sample problems to work in their notes. After the students have worked the sample problems, call on students to go to the chalkboard and show how they arrived at their answers.
   - Have students complete Assignment Sheet #1, and go over answers in class.
   - Have students complete Assignment Sheet #2, and go over answers in class.
   - Have students complete Assignment Sheet #3, and go over answers in class.

F. Give test.

G. Critique test and discuss in class.

H. Reteach and retest as necessary.

III. Unit reference — Spann, Margaret. *Related Vocational Math*. Stillwater, Oklahoma: State Department of Vocational and Technical Education/Curriculum and Instructional Materials Center, 1972.

PERIMETERS IN GEOMETRY
UNIT II

PRETEST

NAME _____ SCORE _____

1. Define perimeter.

_____

_____

_____

2. Write the formula for calculating the perimeter of each of these figures.

   a. Rectangle

   b. Square

   c. Triangle

PRETEST

3. Calculate the following perimeters.

   a. Rectangles

      1. L = 5″, W = 3″

      2. L = 4½″, W = 2¼″

      3. L = 3.5″, W = 4.5″

   b. Squares

      1. S = 4.25″

PRETEST

2. S = 12″

3. S = ¾″

c. Triangles

1. $S_1 = 3''$, $S_2 = 4''$, $S_3 = 5''$

2. $S_1 = 2\frac{1}{2}''$, $S_2 = 3''$, $S_3 = 4''$

PRETEST

3. $S_1 = 2.5''$, $S_2 = 3.5''$, $S_3 = 3''$

PERIMETERS IN GEOMETRY
UNIT II

ANSWERS TO PRETEST

1. The distance around the edge of a flat figure

2. a. $P = 2L + 2W$
   b. $P = 4S$
   c. $P = S_1 + S_2 + S_3$

3. a. Rectangles

      1. 16″
      2. 13.5″
      3. 16″

   b. Squares

      1. 17″
      2. 48″
      3. 3″

   c. Triangles

      1. 12″
      2. 9½″
      3. 9″

PERIMETERS IN GEOMETRY
UNIT II

INFORMATION SHEET

I. Definition of perimeter — The distance around the edge of a flat figure

II. Formulas for perimeter

(NOTE: P — perimeter, L — length, W — width, S—length of a side, S_1—length of first side, S_2—length of a second side, S_3—length of a third side)

A. Rectangle — Perimeter = 2 × Length + 2 × Width *or* P = 2L + 2W

B. Square — Perimeter = 4 × Length of a Side *or* P = 4S

C. Triangle — Perimeter = Length of Side 1 + Length of Side 2 + Length of Side 3 *or* $P = S_1 + S_2 + S_3$

III. Calculating perimeters

A. Rectangle with length of 4 feet and width of 3 feet

P = 2L + 2W

P = (2 × 4′) + (2 × 3′)

P = 8 + 6

P = 14′

(NOTE: Label the answer with the correct measurement.)

B. Square with 6-inch sides

P = 4S

P = 4 × 6″

P = 24″

C. Triangle with one 2-foot side, one 3-foot side, and one 8-foot side

$P = S_1 + S_2 + S_3$

P = 2′ + 3′ + 8′

P = 13′

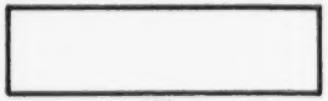
PERIMETERS IN GEOMETRY
UNIT II

ASSIGNMENT SHEET #1 — CALCULATE PERIMETERS OF RECTANGLES

NAME _____ SCORE _____

Calculate the perimeters for the following rectangles. Show your work.

1.

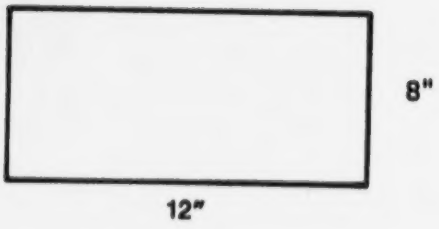


2.

3.

ASSIGNMENT SHEET #1

4.



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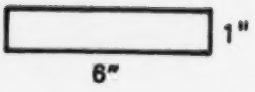

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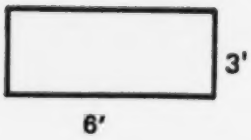


7. L = 15", W = 8"

ASSIGNMENT SHEET #1

8. L = 2½", W = 2"

9. L = 8", W = 6¼"

10. L = 3¼", W = 6"

11. L = 1 mile, W = ½ mile

ASSIGNMENT SHEET #1

12. L = 8 yards, W = 3 yards

13. L = 4", W = 4½"

14. L = 8¼', W = 15¾'

15. L = 12', W = 7'

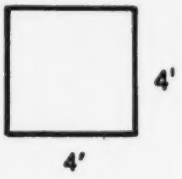
PERIMETERS IN GEOMETRY
UNIT II

ASSIGNMENT SHEET #2 — CALCULATE PERIMETERS OF SQUARES

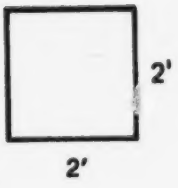
NAME _____ SCORE _____

Calculate the perimeter for each of the following squares. Show your work.

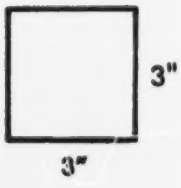
1.



2.



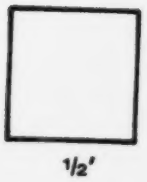
3.



ASSIGNMENT SHEET #2

4.

5.



6.

7. S = 8"

ASSIGNMENT SHEET #2

8. S = 7"

9. S = 10½"

10. S = 7.2"

11. S = ¾"

ASSIGNMENT SHEET #2

12. S = 2″

13. S = 10½″

14. S = ¼″

15. S = ½″

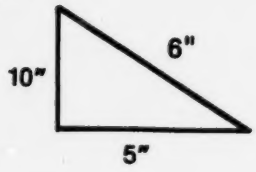
PERIMETERS IN GEOMETRY
UNIT II

ASSIGNMENT SHEET #3 — CALCULATE PERIMETERS OF TRIANGLES

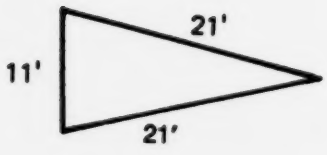
NAME _____ SCORE _____

Calculate the perimeter for each of the following triangles. Show your work.

1.



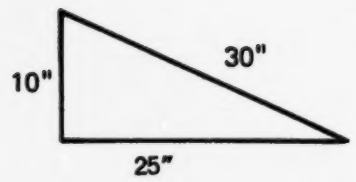
2.



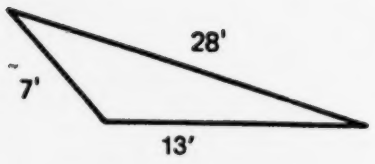
3.

ASSIGNMENT SHEET #3

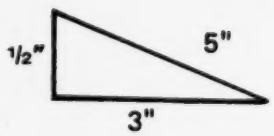
4.



5.



6.



7. $S_1 = 3\frac{3}{4}'$, $S_2 = 5'$, $S_3 = 5'$

ASSIGNMENT SHEET #3

8. $S_1 = 2\frac{1}{8}'$, $S_2 = 5\frac{1}{8}'$, $S_3 = 9'$

9. $S_1 = 8\frac{1}{2}'$, $S_2 = 2\frac{1}{4}'$, $S_3 = 23\frac{1}{4}'$

10. $S_1 = 12'$, $S_2 = 18'$, $S_3 = 16'$

11. $S_1 = 5\frac{1}{4}''$, $S_2 = 4''$, $S_3 = 4''$

ASSIGNMENT SHEET #3

12. $S_1 = 7.2'$, $S_2 = 13.1'$, $S_3 = 3.4'$

13. $S_1 = 4''$, $S_2 = 7''$, $S_3 = 7''$

14. $S_1 = .1'$, $S_2 = .3'$, $S_3 = .5'$

15. $S_1 = 7\frac{1}{20}'$, $S_2 = 8\frac{1}{10}'$, $S_3 = 2'$

PERIMETERS IN GEOMETRY
UNIT II

ANSWERS TO ASSIGNMENT SHEETS

Assignment Sheet #1

1. 24′
2. 28′
3. 24′
4. 40″
5. 14″
6. 18′
7. 46″
8. 9″
9. $28\frac{1}{2}$″
10. $18\frac{1}{2}$″
11. 3 miles
12. 22 yards
13. 17″
14. 48′
15. 38′

Assignment Sheet #2

1. 16′
2. 8′
3. 12″
4. 24″
5. 2′
6. 20″
7. 32″
8. 28″
9. 42″
10. 28.8″
11. 3″
12. 8″
13. 42″
14. 1″
15. 2″

Assignment Sheet #3

1. 21″
2. 53′
3. 15″
4. 65″
5. 48′
6. $8\frac{1}{2}$″
7. $13\frac{3}{4}$′
8. $16\frac{1}{4}$′
9. 34′
10. 46′
11. $13\frac{1}{4}$″
12. 23.7′
13. 18″
14. .9′
15. $17\frac{3}{20}$′

PERIMETERS IN GEOMETRY
UNIT II

TEST

NAME _____ SCORE _____

1. Define perimeter.

_____

_____

_____

2. Write the formulas for calculating the perimeter of each of the following geometric figures.

   a. Rectangle

   b. Square

TEST

c. Triangle

3. Calculate the perimeters of the following geometric figures.

a. Rectangles

1) L = 7", W = 4"

2) L = 3½', W = 2½'

3) L = 6", W = 4"

TEST

4) L = 3", W = 5"

5) L = 2.5', W = 2.5'

b. Squares

1) S = 5"

2) S = 1"

TEST

3) S = 13'

4) S = 22 yards

5) S = 3/4"

c. Triangles

1) S_1 = 7", S_2 = 7", S_3 = 3"

TEST

2) $S_1 = 6\frac{1}{2}'$, $S_2 = 3\frac{1}{2}'$, $S_3 = 3'$

3) $S_1 = 2\frac{3}{4}'$, $S_2 = 3\frac{1}{4}'$, $S_3 = \frac{1}{4}'$

4) $S_1 = 10'$, $S_2 = 10'$, $S_3 = 2'$

5) $S_1 = 12''$, $S_2 = 12''$, $S_3 = 12''$

PERIMETERS IN GEOMETRY
UNIT II

ANSWERS TO TEST

1. The distance around the edge of a flat figure

2. a. $P = 2L + 2W$
   b. $P = 4S$
   c. $P = S_1 + S_2 + S_3$

3. a. 1) 22″
      2) 12′
      3) 20″
      4) 16″
      5) 10′
   b. 1) 20″
      2) 4″
      3) 52′
      4) 88 yards
      5) 3″
   c. 1) 17″
      2) 13′
      3) 6¼′
      4) 22′
      5) 36″

GEOMETRIC AREAS
UNIT III

UNIT OBJECTIVE

After completing this unit, the student should be able to identify shapes of geometric figures, select the correct formulas for finding areas, and calculate the areas of straight-sided geometric figures. This ability will be evidenced by completing assignment sheets and unit test with a minimum score of 85 percent.

SPECIFIC OBJECTIVES

After completing this unit, the student should be able to

1. Identify shapes of geometric figures.
2. Select the correct formulas from a list for finding the areas of given figures.
3. Calculate the areas of straight-sided geometric figures.

GEOMETRIC AREAS
UNIT III

SUGGESTED ACTIVITIES

I. Unit contents

A. Objective sheet

B. Suggested activities

C. Pretest

D. Answers to pretest

E. Information sheet

F. Assignment sheets

1. Assignment Sheet #1 — Calculate Areas of Parallelograms
2. Assignment Sheet #2 — Calculate Areas of Rectangles
3. Assignment Sheet #3 — Calculate Areas of Squares
4. Assignment Sheet #4 — Calculate Areas of Triangles
5. Assignment Sheet #5 — Calculate Areas of Rhombuses
6. Assignment Sheet #6 — Calculate Areas of Trapezoids
7. Assignment Sheet #7 — Review Geometric Areas

G. Answers to assignment sheets

H. Test

I. Answers to test

II. Instructor's guide

A. Order (or obtain) materials to supplement unit.

B. Give pretest.

C. Critique pretest and go over results in class.

(NOTE: Be sure to take up pretests after discussing them in class. Students who score 85 percent or higher on the pretest do not need to study this unit.)

SUGGESTED ACTIVITIES

D. Discuss unit and specific objectives.

E. Discuss information and assignment sheets.

1. Teach students to identify the shapes of six geometric figures using the Information Sheet.

   - Put examples of the shapes on the chalkboard and have students identify the shapes.
   - Use flashcards with the geometric figures on them to help students learn to properly identify the figures.

2. Explain the correct formulas for finding the areas of the given figures using the Information Sheet.

   - Have students find objects or draw objects representing each of the geometric figures; have students write the correct formula for area on each drawing or object.

3. Discuss how to calculate the areas of straight-sided geometric figures using the Information Sheet.

   - Give students examples on the chalkboard; have students take notes as you work the problems.
   - Give the students some sample problems to work at their seats. Have them put their answers (showing their work) on the chalkboard.
   - Have students complete Assignment Sheet #1 and go over answers in class.
   - Have students complete Assignment Sheet #2 and go over answers in class.
   - Have students complete Assignment Sheet #3 and go over answers in class.
   - Have students complete Assignment Sheet #4 and go over answers in class.
   - Have students complete Assignment Sheet #5 and go over answers in class.
   - Have students complete Assignment Sheet #6 and go over answers in class.
   - Have students complete Assignment Sheet #7 and go over answers in class.

   (NOTE: If you do not want to take time to go over all assignment sheets in class, you may post the correct answers in an appropriate spot and have students check their own work.)

SUGGESTED ACTIVITIES

F. Give test.

G. Critique test and discuss in class.

H. Reteach and retest as necessary.

III. Unit references — Spann, Margaret. *Related Vocational Math*. Stillwater, Oklahoma: State Department of Vocational and Technical Education/Curriculum and Instructional Materials Center, 1972.

GEOMETRIC AREAS
UNIT III

PRETEST

NAME _____ SCORE _____

- Identify the shape in each of the following problems and write the name on line "a."
- Select the correct formula to find the area of each figure and write the formula on line "b."

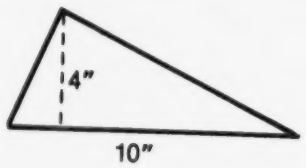
FORMULAS

$A = S^2$ $A = LW$ $A = \frac{1}{2}H(B_1 + B_2)$

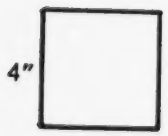
$A = BH$ $A = \frac{1}{2}BH$

- Calculate the area for each figure and write this answer on line "c." Show your work.

1. a. _____
   b. _____
   c. _____



2. a. _____
   b. _____
   c. _____

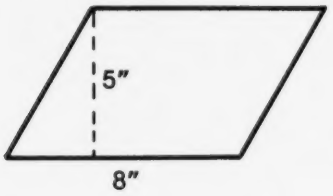


PRETEST

3. a. _____

b. _____

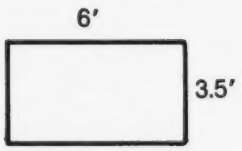
c. _____



4. a. _____

b. _____

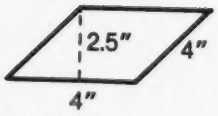
c. _____



5. a. _____

b. _____

c. _____

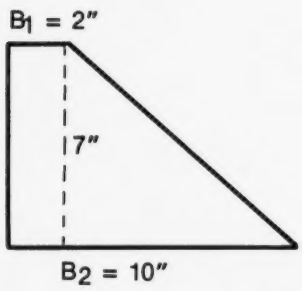


PRETEST

6. a. _____

b. _____

c. _____



GEOMETRIC AREAS
UNIT III

ANSWERS TO PRETEST

1. a. Triangle
   b. $A = \frac{1}{2} BH$
   c. 20 square inches

2. a. Square
   b. $A = S^2$
   c. 16 square inches

3. a. Parallelogram
   b. $A = BH$
   c. 40 square inches

4. a. Rectangle
   b. $A = LW$
   c. 21 square inches

5. a. Rhombus
   b. $A = BH$
   c. 10 square inches

6. a. Trapezoid
   b. $A = \frac{1}{2}H (B_1 + B_2)$
   c. 42 square inches

GEOMETRIC AREAS
UNIT III

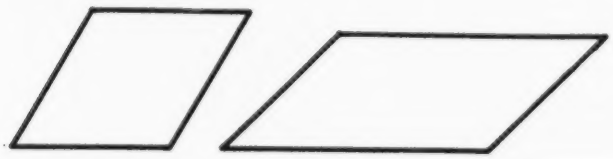
INFORMATION SHEET

I. Calculating area of a parallelogram

(NOTE: A—area, B—base, H—height or altitude, L—length, W—width, S—length of side, S^2—S × S, B_1—length of one base, B_2—length of the other base)

A. Shape — Has four sides; opposite sides are parallel with no angles being right angles

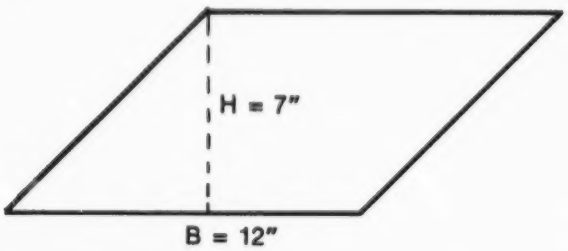
FIGURE 1



B. Formula — Area = Base × Height *or* A = BH

EXAMPLE:

FIGURE 2



Parallelogram — B = 12", H = 7"

A = BH

A = 12 × 7

A = 84 square inches

(NOTE: Area measures are labeled with square units of measure.)

INFORMATION SHEET

II. Calculating area of a rectangle

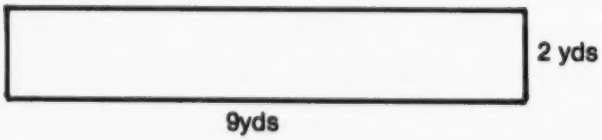
A. Shape — Has four sides; opposite sides are equal length and all four interior angles are right angles

FIGURE 3

B. Formula — Area = Length × Width *or* A = LW

EXAMPLE:

FIGURE 4



Rectangle — L = 9 yards, W = 2 yards

A = L × W

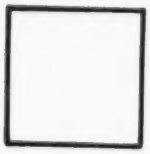
A = 9 yards × 2 yards

A = 18 square yards

III. Calculating area of a square

A. Shape — Has four sides of equal length with four interior right angles

FIGURE 5

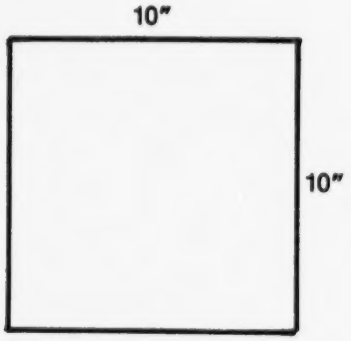


INFORMATION SHEET

B. Formula — Area = Length of Side × Length of Side *or* $A = S^2$

EXAMPLE:

FIGURE 6



Square — S = 10″

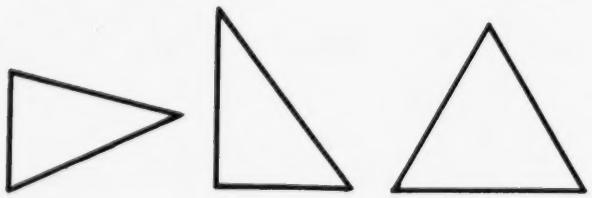
A = 10″ × 10″

A = 100 square inches

IV. Calculating area of a triangle

A. Shape — Has three sides and three interior angles; sides and angles can be of various measurements

FIGURE 7

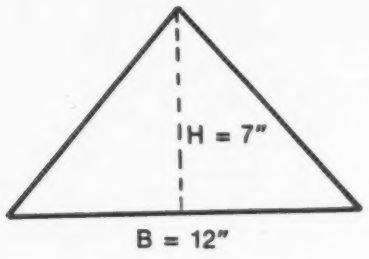


INFORMATION SHEET

B. Formula — Area = ½ Base × Height *or* A = ½BH

EXAMPLE:

FIGURE 8



Triangle — B = 12″, H = 7″

A = ½ BH

A = ½ × 12″ × 7″

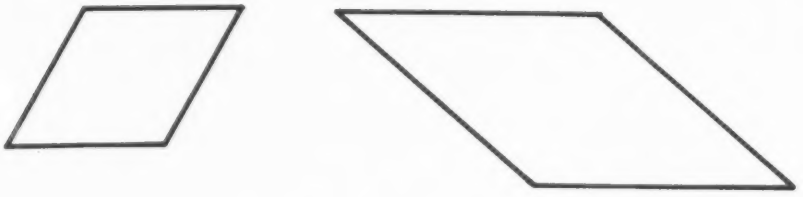
A = 6″ × 7″

A = 42 square inches

V. Calculating area of a rhombus

A. Shape — Parallelogram with all sides equal

FIGURE 9

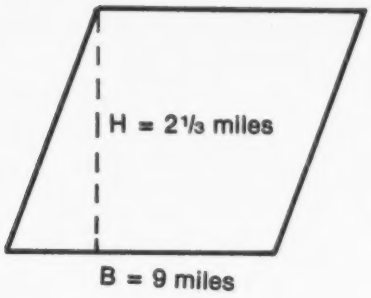


INFORMATION SHEET

B. Formula — Area = Base × Height *or* A = BH

EXAMPLE:

FIGURE 10



Rhombus — B = 9 miles, H = 2⅓ miles

A = 9 × 2⅓

A = $^{9}/_{1}$ × $^{7}/_{3}$

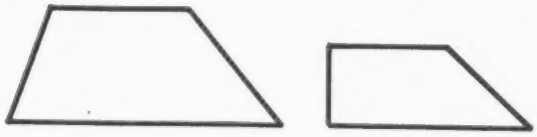
A = $^{63}/_{3}$

A = 21 square miles

VI. Calculating area of a trapezoid

A. Shape — Has four sides; two sides are parallel

FIGURE 11

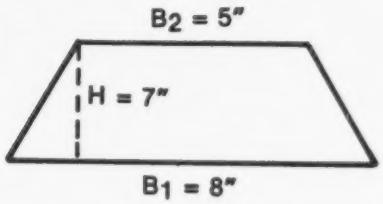


INFORMATION SHEET

B. Formula — Area = ½ Height × (Base 1 + Base 2) *or* $A = \frac{1}{2} H (B_1 + B_2)$

EXAMPLE:

FIGURE 12



Trapezoid — $h = 7''$, $b_1 = 8''$, $b_2 = 5''$

$A = \frac{1}{2}H (B_1 + B_2)$

$A = (\frac{1}{2} \times 7) (8 + 5)$

$A = (\frac{7}{2}) (13)$

$A = \frac{7}{2} \times \frac{13}{1}$

$A = \frac{91}{2}$

$A = 45\frac{1}{2}$ square inches

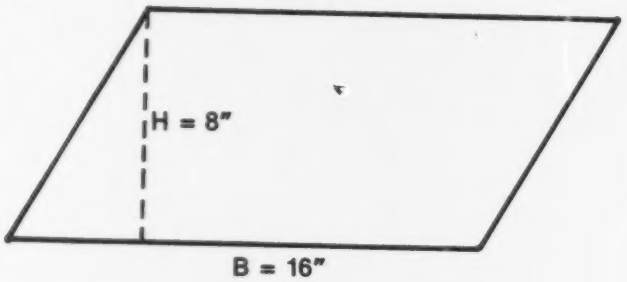
GEOMETRIC AREAS
UNIT III

ASSIGNMENT SHEET #1 — CALCULATE AREAS OF PARALLELOGRAMS

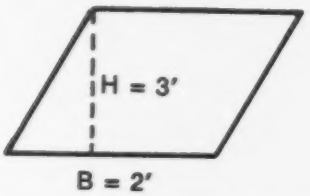
NAME _____ SCORE _____

Calculate the area of each of the following parallelograms. Show your work.

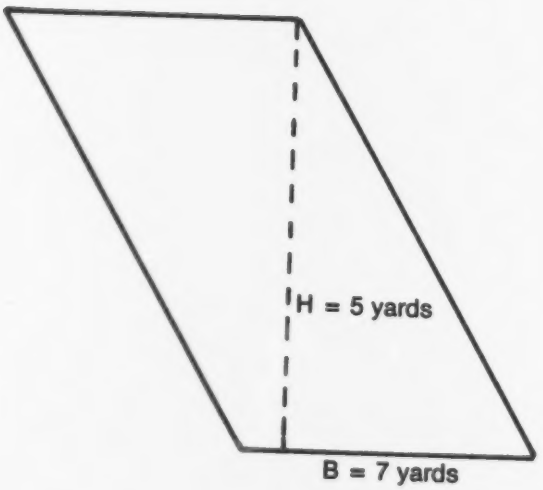
1.



2.



3.



ASSIGNMENT SHEET #1

4. B = 4½ miles, H = 5⅓ miles

5. B = 1.7′, H = 4.2′

6. B = 8″, H = 2½″

7. B = 106′, H = 12′

ASSIGNMENT SHEET #1

8. B = $10\frac{1}{3}''$, H = $1\frac{1}{5}''$

9. B = $13\frac{1}{6}'$, H = 12′

10. B =12.3 yards, H = 1.1 yards

GEOMETRIC AREAS
UNIT III

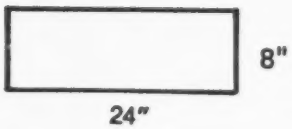
ASSIGNMENT SHEET #2 — CALCULATE AREAS OF RECTANGLES

NAME _____ SCORE _____

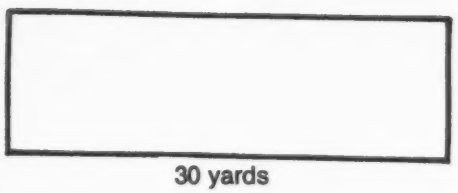
Calculate the area of each of the following rectangles. Show your work.

1.

2.



3.



ASSIGNMENT SHEET #2

4. L = 8″, W = 2½″

5. L = 10¼′, W = 8½′

6. L = 4.6 yards, W = 8.4 yards

7. L = 10½″, W = 8¼″

ASSIGNMENT SHEET #2

8. L = 6.5 miles, W = 7.15 miles

9. L = 4.75′, W = 3.1′

10. L = 12.2″, W = .8″

GEOMETRIC AREAS
UNIT III

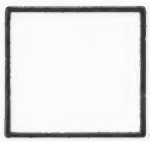
ASSIGNMENT SHEET #3 — CALCULATE AREAS OF SQUARES

NAME _____ SCORE _____

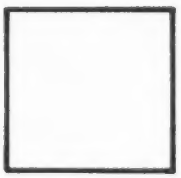
Calculate the area for each of the following squares. Show your work.

1.

2.



3.



ASSIGNMENT SHEET #3

4. S = 10½ miles

5. S = 6⅓ feet

6. S = 8.7 yards

7. S = 1.42″

ASSIGNMENT SHEET #3

8. S = $9\frac{2}{3}$"

9. S = 14.8'

10. S = $\frac{1}{8}$ mile

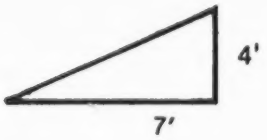
GEOMETRIC AREAS
UNIT III

ASSIGNMENT SHEET #4 — CALCULATE AREAS OF TRIANGLES

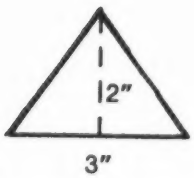
NAME _____ SCORE _____

Calculate the area of each of the following triangles. Show your work.

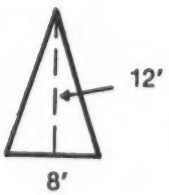
1.



2.



3.



ASSIGNMENT SHEET #4

4. B = 12″, H = 8½″

5. B = 3.2′, H = 5.8′

6. B = 1.01 miles, H = .05 mile

7. B = .8″, H = .2″

ASSIGNMENT SHEET #4

8. B = $1\frac{1}{7}$ yards, H = $5\frac{1}{3}$ yards

9. B = $9\frac{1}{2}$", H = $10\frac{1}{4}$"

10. B = 8', H = .3'

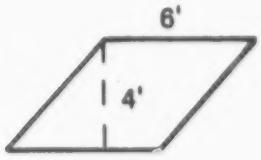
GEOMETRIC AREAS
UNIT III

ASSIGNMENT SHEET #5 — CALCULATE AREAS OF RHOMBUSES

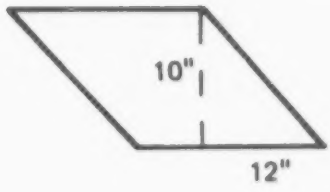
NAME _____ SCORE _____

Calculate the area of each of the following rhombuses. Show your work.

1.



2.



3.

ASSIGNMENT SHEET #5

4. B = 8′, H = 7′

5. B = 10½″, H = 6⅓″

6. B = 1.2 yards, H = .8 yards

7. B = ⅛′, H = 1/10′

ASSIGNMENT SHEET #5

8. B = 1.03", H = .3"

9. B = 3.4', H = 2.2'

10. B = 30¼ miles, H = 8½ miles

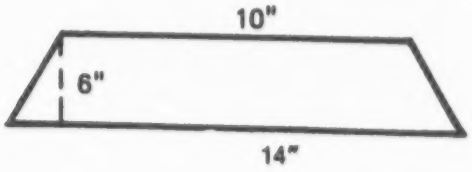
GEOMETRIC AREAS
UNIT III

ASSIGNMENT SHEET #6 — CALCULATE AREAS OF TRAPEZOIDS

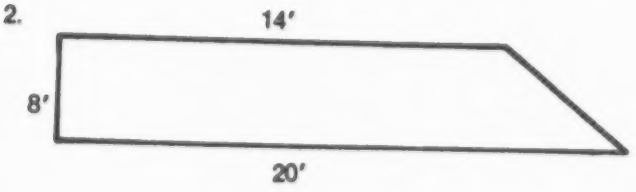
NAME _____ SCORE _____

Calculate the area of each of the following trapezoids. Show your work.

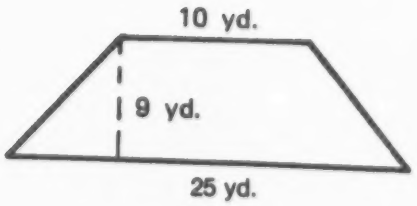
1.



2.



3.



ASSIGNMENT SHEET #6

4. $H = 4''$, $B_1 = 7''$, $B_2 = 2''$

5. $H = 8.2$ yards, $B_1 = 1.3$ yards, $B_2 = .5$ yards

6. $H = 3\frac{1}{2}'$, $B_1 = 3\frac{1}{4}'$, $B_2 = 2\frac{3}{4}'$

7. $H = 12$ miles, $B_1 = 5\frac{1}{2}$ miles, $B_2 = 7\frac{1}{2}$ miles

ASSIGNMENT SHEET #6

8. $H = 13''$, $B_1 = 6''$, $B_2 = 4''$

9. $H = .04'$, $B_1 = 1.7'$, $B_2 = 2.3'$

10. $H = 1.8''$, $B_1 = .5''$, $B_2 = 8.5''$

GEOMETRIC AREAS
UNIT III

ASSIGNMENT SHEET #7 — REVIEW GEOMETRIC AREAS

NAME _____ SCORE _____

Calculate the areas of each of the following figures. Show your work.

1. A triangle with a base 4 inches long and height 3 inches.

2. A trapezoid 8 feet high that has a lower base 10 feet long and an upper base 6 feet long.

3. A square whose sides are 8 inches long.

ASSIGNMENT SHEET #7

4. A rectangle 4 feet long and 3 feet high.

5. A rhombus whose sides are 10 inches long and whose height is 6 inches.

6. A parallelogram with a base 14 feet long and height 8 feet long.

7. A triangle with a base $4\frac{1}{2}$ feet long and a height of 2 feet.

ASSIGNMENT SHEET #7

8. A trapezoid 22 inches high that has a lower base 16 inches long and an upper base 14 inches long.

9. A square whose sides are 2 feet long.

10. A rectangle 33 inches long and 15 inches high.

11. A rhombus whose sides are 1½ feet long and whose height is 13 inches.

ASSIGNMENT SHEET #7

12. A parallelogram with a base 6 feet long and height 4 feet long.

GEOMETRIC AREAS
UNIT III

ANSWERS TO ASSIGNMENT SHEETS

Assignment Sheet #1

1. 128 square inches
2. 6 square feet
3. 35 square yards
4. 24 square miles
5. 7.14 square feet
6. 20 square inches
7. 1272 square inches
8. $12^{2}/_{5}$ square inches
9. 158 square feet
10. 13.53 square yards

Assignment Sheet #2

1. 80 square feet
2. 192 square inches
3. 300 square yards
4. 20 square inches
5. $87\,1/_{8}$ square feet
6. 38.64 square yards
7. $86^{5}/_{8}$ square inches
8. 46.475 square miles
9. 14.725 square feet
10. 9.76 square inches

Assignment Sheet #3

1. 64 square inches
2. 225 square feet
3. 529 square yards
4. $110\,1/_{4}$ square miles
5. $40\,1/_{9}$ square feet
6. 75.69 square yards
7. 2.0164 square inches
8. $93^{4}/_{9}$ square inches
9. 219.04 square feet
10. $1/_{64}$ square mile

Assignment Sheet #4

1. 14 square feet
2. 3 square inches
3. 48 square feet
4. 51 square inches
5. 9.28 square feet
6. .02525 square mile
7. .08 square inch
8. $3\,1/_{21}$ square yards
9. $97^{3}/_{8}$ square inches
10. 1.2 square feet

Assignment Sheet #5

1. 24 square feet
2. 120 square inches
3. 168 square yards
4. 56 square feet
5. $66\,1/_{2}$ square inches
6. .96 square yard
7. $1/_{80}$ square foot
8. .309 square inch
9. 7.48 square feet
10. $257\,1/_{8}$ square miles

ANSWERS TO ASSIGNMENT SHEETS

Assignment Sheet #6

1. 72 square inches
2. 136 square feet
3. 157½ square yards
4. 18 square inches
5. 7.38 square yards
6. 10½ square feet
7. 78 square miles
8. 65 square inches
9. .08 square feet
10. 8.1 square inches

Assignment Sheet #7

1. 6 square inches
2. 64 square feet
3. 64 square inches
4. 12 square feet
5. 60 square inches
6. 112 square feet
7. 4½ square feet
8. 330 square inches
9. 4 square feet
10. 495 square inches
11. 234 square inches
12. 24 square feet

GEOMETRIC AREAS
UNIT III

TEST

NAME _____ SCORE _____

Directions:

- Identify the shape in each of the following problems and write the answer on line "a."
- Select the correct formula to find the area of each figure and write the formula on line "b."

FORMULAS:

$A = S^2$ $A = LW$ $A = \frac{1}{2} H (B_1 + B_2)$

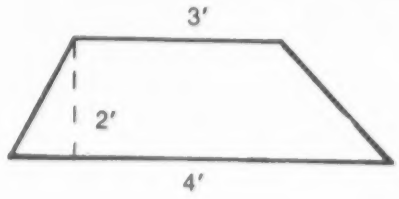
$A = BH$ $A = \frac{1}{2} BH$

- Calculate the area for each figure and write this answer on line "c."

1. a. _____

   b. _____

   c. _____

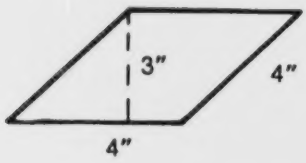


TEST

2. a. _____

   b. _____

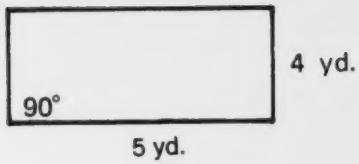
   c. _____



3. a. _____

   b. _____

   c. _____

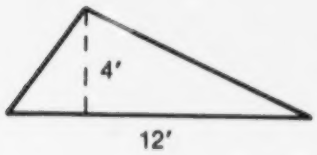


TEST

4. a. _____

b. _____

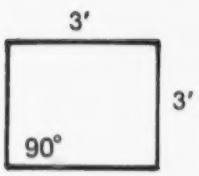
c. _____



5. a. _____

b. _____

c. _____

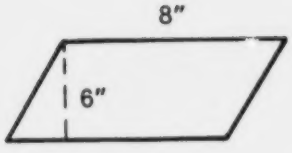


TEST

6. a. _____

b. _____

c. _____



GEOMETRIC AREA
UNIT III

ANSWERS TO TEST

1. a. Trapezoid
   b. $A = \frac{1}{2}H (B_1 + B_2)$
   c. 7 square feet

2. a. Rhombus
   b. $A = BH$
   c. 12 square inches

3. a. Rectangle
   b. $A = BH$ or $A = LW$
   c. 20 square yards

4. a. Triangle
   b. $A = \frac{1}{2} BH$
   c. 24 square feet

5. a. Square
   b. $A = BH$ or $A = S^2$
   c. 9 square feet

6. a. Parallelogram
   b. $A = BH$
   c. 48 square inches

CIRCUMFERENCE AND AREA OF CIRCLES
UNIT IV

UNIT OBJECTIVE

After completing this unit, the student should be able to match terms and definitions related to circles, write the formulas for finding circumference and area of circles, and solve problems dealing with area and circumference of circles. This knowledge will be evidenced by completing assignment sheets and unit test with a minimum score of 85 percent.

SPECIFIC OBJECTIVES

After completing this unit, the student should be able to

1. Match terms and definitions related to circles.
2. Write the formulas for finding the circumference and area of a circle.
3. Calculate circumference of circles
4. Calculate area of circles.

CIRCUMFERENCE AND AREA OF CIRCLES
UNIT IV

SUGGESTED ACTIVITIES

I. Unit contents

A. Objective sheet

B. Suggested activities

C. Pretest

D. Answers to pretest

E. Information sheet

F. Assignment sheets

1. Assignment Sheet #1 — Calculate Circumference of Circles

2. Assignment Sheet #2 — Calculate Area of Circles

3. Assignment Sheet #3 — Review Circumference and Area of Circles

G. Answers to assignment sheets

H. Test

I. Answers to test

II. Instructor's guide

A. Order (or obtain) materials to supplement unit.

B. Give pretest.

C. Critique pretest and go over results in class.

(NOTE: Be sure to take up pretests after discussing them in class. Students who score 85 percent or higher on the pretest do not need to study this unit.)

D. Provide students with copies of unit.

E. Discuss unit and specific objectives.

- Explain that in this unit students will learn how to calculate the circumference and area of circles.

F. Discuss information and assignment sheets.

SUGGESTED ACTIVITIES

1. Review definitions relevant to circumference and area of circles using Information Sheet, Section I.

   - Draw two circles on the chalkboard; indicate the difference between diameter and radius by drawing both and labeling them on the circles. Also, label the circumference; shade the area of the circle, and label it.

     (NOTE: Using colored chalk might make it easier for students to see the various elements being discussed.)

2. Discuss the formulas for calculating area and circumference; use Information Sheet, Section II.

   - Write the formulas on the board and give examples for the students to copy into their notes.

3. Explain how to calculate the circumference using Information Sheet, Section III.

   - Put examples on the chalkboard, work through the examples, and have students take notes.

   - Have students complete Assignment Sheet #1; go over answers in class.

4. Explain how to solve for the area using Information Sheet, Section IV.

   - Put examples on the chalkboard, work through the examples, and have students take notes.

   - Have students complete Assignment Sheet #2; go over answers in class.

   - Have students complete Assignment Sheet #3; go over answers in class.

G. Give test.

H. Critique test and discuss in class.

I. Reteach and retest as necessary.

III. Unit reference — Spann, Margaret. *Related Vocational Math*. Stillwater, Oklahoma: State Department of Vocational and Technical Education/Curriculum and Instructional Materials Center, 1972.

CIRCUMFERENCE AND AREA OF CIRCLES
UNIT IV

PRETEST

NAME _____ SCORE _____

1. Match the following terms and definitions. Write the correct answers in the blanks.

_____a. The distance around a circle	1. Area
_____b. A line through the center joining two points on a circle	2. Circumference
_____c. A line from the center of a circle to any point on the circle	3. Diameter
_____d. The greek letter used to represent the number by which the diameter of a circle is multiplied to get the circumference	4. Pi
_____e. The measure of the surface within a circle	5. Radius

2. Write the formulas for finding circumference and area of a circle.

   a. Circumference_____

   b. Area_____

3. a. Calculate the circumference of circles with the following dimensions.

      1. Radius = 15 feet

      2. Diameter = 6 feet

PRETEST

3. Radius = 2 yards

b. Calculate the circumferences of the following items.

1. A round breaking pen with a radius of 11 feet.

2. A circular saw blade with a diameter of 7 inches.

3. A pie pan with a diameter of 9".

PRETEST

4. a. Calculate the areas of circles with the following dimensions.

   1. Radius = 4 inches

   2. Diameter = 12 inches

   3. Radius = 2 feet

b. Calculate the areas of the following circles.

   1. What is the area of a circular saw ring with a diameter of 100 feet?

PRETEST

2. How many square feet were used in making a flower garden with a radius of 8 feet?

3. How many square inches in a Hula Hoop that has a radius of 24 inches?

CIRCUMFERENCE AND AREA OF CIRCLES
UNIT IV

ANSWERS TO PRETEST

1. a. 2
   b. 3
   c. 5
   d. 4
   e. 1

2. a. $C = \pi D$ or $C = 2\pi R$
   b. $A = \pi R^2$

3. a. 1. 94.2 feet
      2. 18.84 feet
      3. 12.56 yards

   b. 1. 69.08 feet
      2. 21.98 inches
      3. 28.26 inches

4. a. 1. 50.24 square inches
      2. 113.04 square inches
      3. 12.56 square feet

   b. 1. 7850 square feet
      2. 200.96 square feet
      3. 1808.64 square inches

CIRCUMFERENCE AND AREA OF CIRCLES
UNIT IV

INFORMATION SHEET

I. Terms and definitions

A. Circumference (C) — The distance around a circle

B. Diameter (D) — A line through the center joining two points on a circle

C. Radius (R) — A line from the center of a circle to any point on the circle

(NOTE: The diameter of any circle is twice as long as the radius of that circle.)

D. Pi (π) — The Greek letter used to represent the number by which the diameter of a circle is multiplied to get the circumference

(NOTE: Use $\pi = 3\frac{1}{7}$, 3.1416, or 3.14 depending on which is more convenient in any given example.)

E. Area (A) — The measure of the surface within a circle

II. Formulas

(NOTE: A—area, R—length of the radius, $R^2 = R \times R$, C—circumference, D—diameter)

A. Area — $A = \pi R^2$ *or* $\pi \times R \times R$

B. Circumference — $C = \pi D$ *or* $C = 2 \pi R$

III. Calculating the circumference of a circle

A. Determine radius or diameter

B. Solve using formula for circumference

EXAMPLE: A circle has a radius of 12 inches.

$C = \pi D$

$C = 3.14 \times 24$

$C = 75.36$ inches

(NOTE: Circumference is a measure of length and the labels on the answers will be measures of length.)

INFORMATION SHEET

IV. Calculating the area of a circle

A. Determine the radius

B. Solve using formula for area

EXAMPLE: A circle has a radius of 5 inches.

$A = \pi R^2$

$A = 3.14 \times 5 \times 5$

A = 78.50 square inches

CIRCUMFERENCE AND AREA OF CIRCLES
UNIT IV

ASSIGNMENT SHEET #1 — CALCULATE CIRCUMFERENCE OF CIRCLES

NAME _____ SCORE _____

1. Calculate the circumference of circles with the following dimensions. (Use $\pi = 3.14$)

   a. Diameter = 4 feet

   b. Diameter = 6 inches

   c. Radius = 2.5 inches

   d. Diameter = 8 yards

ASSIGNMENT SHEET #1

e. Radius = 8 yards

f. Radius = 9 inches

g. Diameter = 12 feet

h. Diameter = 14 feet

i. Radius = 13.3 yards

ASSIGNMENT SHEET #1

j. Radius = .0026 inch

k. Diameter = 10 feet

l. Radius = 10 feet

2. Calculate circumference for each of the following problems. (Use $\pi = 3.14$)

a. Find the circumference of a circle if the radius is 3 feet.

b. Mrs. Stevens has a flower garden in the shape of a circle. The diameter of the garden is 12 feet. Find the circumference of the garden.

ASSIGNMENT SHEET #1

c. The tallest tree in the world is a redwood tree in nothern California. It has a diameter of 14 feet. Find the distance around the tree.

d. The diameter of a circular table cloth is 38 inches. What is the circumference of the table cloth?

e. The color wheel is 28 inches in diameter. What is the circumference?

f. The radius of a circular garden is 7 feet. How long is the path that encloses the circular garden?

g. How many inches of lace are needed to go around a table cover that has a 10-inch radius?

ASSIGNMENT SHEET #1

h. Find the circumference of an automobile tire 33 inches in diameter.

i. Mary made cookies three inches in diameter. What was the distance around each cookie?

j. The radius of a circular skirt is 20 inches. What is the circumference of the skirt?

CIRCUMFERENCE AND AREA OF CIRCLES
UNIT IV

ASSIGNMENT SHEET #2 — CALCULATE AREA OF CIRCLES

NAME _____ SCORE _____

1. Calculate the areas of circles with the following measurements. (Use $\pi = 3.14$)

   a. Radius = 6 inches

   b. Diameter = 10 feet

   c. Diameter = 14 feet

   d. Radius = 2.5 inches

ASSIGNMENT SHEET #2

e. Radius = 8 feet

f. Diameter = 11 inches

g. Diameter = 7 feet

h. Radius = 3 inches

i. Radius = 10 inches

ASSIGNMENT SHEET #2

j. Diameter = 13 feet

k. Radius = 4 inches

l. Diameter = 5 feet

2. Calculate area in each of the following problems. (Use $\pi = 3.14$)

a. Find the area of a circle that has a diameter of 10 feet.

b. The radius of a circular flower bed is 20 feet. Find the area.

ASSIGNMENT SHEET #2

c. The radius of a circle is 5 inches. What is the area of the circle?

d. The diameter of a kitchen clock face is 16 inches. What is the area of the clock face?

e. A circular walk 2 feet wide is laid around a flower bed 10 feet in diameter. What is the area of the walk? (Find the area of a circle 14 feet in diameter and subtract the area of a circle 10 feet in diameter.)

f. The diameter of the top of a circular table measures 36 inches. What is the area of the top of the table?

ASSIGNMENT SHEET #2

g. Find the area over which a cow may graze, if she is tied to a stake with a 15-foot rope.

h. A circular table cloth is 5 feet in diameter. Find the area.

i. Find the area of a circle whose radius is 8 feet.

j. Greg paid $1.00 for a pizza with a radius of 5 inches. What do you think is a reasonable price for a pizza with a radius of 10 inches? (Find the area of a circle with a 5-inch radius, then find the area of a circle with a 10-inch radius. Compare their sizes.)

CIRCUMFERENCE AND AREA OF CIRCLES
UNIT IV

ASSIGNMENT SHEET #3 — REVIEW CIRCUMFERENCE AND AREA OF CIRCLES

NAME _____ SCORE _____

Calculate circumference and area for circles with the following dimensions. (Use $\pi = 3.14$)

	RADIUS	DIAMETER	CIRCUMFERENCE	AREA
1.	3 inches		a. _____	b. _____
2.		22 feet	a. _____	b. _____
3.	6.8 inches		a. _____	b. _____
4.	16 yards		a. _____	b. _____
5.		3.5 feet	a. _____	b. _____
6.		6 inches	a. _____	b. _____
7.	2.1 feet		a. _____	b. _____
8.		5 feet	a. _____	b. _____
9.		2 miles	a. _____	b. _____
10.	12 feet		a. _____	b. _____
11.	15 yards		a. _____	b. _____
12.		50 feet	a. _____	b. _____

CIRCUMFERENCE AND AREA OF CIRCLES
UNIT IV

ANSWERS TO ASSIGNMENT SHEETS

Assignment Sheet #1

1. a. 12.56 feet
   b. 18.84 inches
   c. 15.70 inches
   d. 25.12 yards
   e. 50.24 yards
   f. 56.52 inches
   g. 37.68 feet
   h. 43.96 feet
   i. 83.524 yards
   j. .016328 inch
   k. 31.40 feet
   l. 62.80 feet

2. a. 18.84 feet
   b. 37.68 feet
   c. 43.96 feet
   d. 119.32 inches
   e. 87.92 inches
   f. 43.96 feet
   g. 62.80 inches
   h. 103.62 inches
   i. 9.42 inches
   j. 125.60 inches

Assignment Sheet #2

1. a. 113.04 square inches
   b. 78.50 square feet
   c. 153.86 square feet
   d. 19.625 square inches
   e. 200.96 square feet
   f. 94.985 square inches
   g. 38.465 square feet
   h. 28.26 square inches
   i. 314 square inches
   j. 132.665 square feet
   k. 50.24 square inches
   l. 19.625 square inches

2. a. 78.50 square feet
   b. 1256.00 square feet
   c. 78.50 square inches
   d. 200.96 square inches
   e. 75.36 square feet
   f. 1017.36 square inches
   g. 706.50 square feet
   h. 19.6250 square feet
   i. 200.96 square feet
   j. $4.00

Assignment Sheet #3

1. a. 18.84 inches
   b. 28.26 square inches
2. a. 69.08 feet
   b. 379.94 square feet
3. a. 42.704 inches
   b. 145.1936 square inches
4. a. 100.48 yards
   b. 803.84 square yards

ANSWERS TO ASSIGNMENT SHEETS

5. a. 10.990 feet
   b. 9.61625 square feet
6. a. 18.84 inches
   b. 28.26 square inches
7. a. 13.188 feet
   b. 13.8474 square feet
8. a. 15.70 feet
   b. 19.6250 square feet
9. a. 6.28 miles
   b. 3.14 square miles
10. a. 75.36 feet
    b. 452.16 square feet
11. a. 94.20 yards
    b. 706.50 square yards
12. a. 157.00 feet
    b. 1962.50 square feet

CIRCUMFERENCE AND AREA OF CIRCLES
UNIT IV

TEST

NAME _____ SCORE _____

1. Match the following terms and definitions. Write the correct answers in the blanks.

_____a. The distance around a circle

_____b. A line through the center joining two points on a circle

_____c. A line from the center of a circle to any point on the circle

_____d. The greek letter used to represent the number by which the diameter of a circle is multiplied to get the circumference

_____e. The measure of the surface within a circle

1. Area
2. Circumference
3. Diameter
4. Pi
5. Radius

2. Write the formulas for finding circumference and area of a circle.

   a. Circumference

   b. Area

3. a. Calculate the circumferences of circles with the following dimensions.

   1) Radius = 5 feet

   2) Diameter = 8 feet

   3) Diameter = 12 feet

   4) Radius = 7.5 feet

   5) Radius = 3 feet

TEST

b. Calculate the circumferences of the following.

1) A flower bed with a radius of 5 feet

2) A circular table cloth with a diameter of 4 feet

3) A chocolate cup cake with a radius of 1 inch

4) A plate with a diameter of 5.5 inches

5) A circular vase with a diameter of 3.5 inches

4. a. Calculate the areas of the circles with the following dimensions.

1) Radius = 3 inches

2) Radius = 5 inches

3) Diameter = 7 inches

4) Diameter = 14 inches

5) Radius = 6 inches

TEST

b. Calculate the areas of the circles mentioned to solve the following problems.

1) Jane made pancakes 4 inches in diameter. How many square inches are in the area of each pancake?

2) Mary's sand bed was 6 feet in diameter. What was the area of the sand bed?

3) Sue bought a cherry pie that was 9 inches in diameter. How many square inches of pie did she buy?

4) How many square feet were used in making a circular garden 10 feet in diameter?

5) The huge birthday cake was served on a circular tray that had a 7 inch radius. What was the area of the circular tray?

CIRCUMFERENCE AND AREA OF CIRCLES
UNIT IV

ANSWERS TO TEST

1. a. 2
   b. 3
   c. 5
   d. 4
   e. 1

2. a. $C = \pi D$ or $C = 2\pi R$
   b. $A = \pi R^2$

3. a. 1) 31.40 feet
      2) 25.12 feet
      3) 37.68 feet
      4) 47.10 feet
      5) 18.84 feet

   b. 1) 31.40 feet
      2) 12.56 feet
      3) 6.28 inches
      4) 17.27 inches
      5) 10.990 inches

4. a. 1) 28.26 square inches
      2) 78.50 square inches
      3) 38.465 square inches
      4) 153.86 square inches
      5) 113.04 square inches

   b. 1) 12.56 square inches
      2) 28.26 square feet
      3) 63.585 square inches
      4) 78.50 square feet
      5) 153.86 square inches

VOLUME
UNIT V

UNIT OBJECTIVE

After completing this unit, the student should be able to identify and count cubic units to find volume of solid figures. He or she should be able to write and apply the formula for volume. This ability will be evidenced by completing assignment sheets and unit test with a minimum score of 85 percent.

SPECIFIC OBJECTIVES

After completing this unit, the student should be able to

1. Identify a cubic unit.
2. Determine the volume of solid figures by counting the cubic units in the solid figures.
3. Write the formula for finding volume of rectangular solid.
4. Calculate the volumes of figures by applying the formula for volume.

VOLUME
UNIT V

SUGGESTED ACTIVITIES

I. Unit contents

A. Objective sheet

B. Suggested activities

C. Pretest

D. Answers to pretest

E. Information sheet

F. Assignment sheets

1. Assignment Sheet #1 — Determine Volume by Counting Cubic Units

2. Assignment Sheet #2 — Make Observations About Cubic Inches and Cubic Feet

3. Assignment Sheet #3 — Calculate Volume by Applying Formula For Volume

4. Assignment Sheet #4 — Calculate Volume of Concrete

G. Answers to assignment sheets

H. Test

I. Answers to test

II. Instructor's guide

A. Order (or obtain) materials to supplement unit.

B. Give pretest.

C. Critique pretest and go over results in class.

(NOTE: Be sure to take up pretests after discussing them in class. Students who score 85 percent or higher on the pretest do not need to study this unit.)

D. Discuss unit and specific objectives.

- Explain that in this unit students will learn how to calculate the volume of solid figures.

SUGGESTED ACTIVITIES

E. Discuss information and assignment sheets.

1. Discuss the definition of cubic unit using Information Sheet, Section I.

   - Draw a cube on the board and label the three dimensions: height, length, and width.

2. Discuss how to calculate volume by counting the cubic units using Information Sheet, Section II.

   - Have students complete Assignment Sheet #1; go over answers in class.

   - Have the students complete Assignment Sheet #2; go over answers in class.

3. Introduce and explain the formula for volume; use Information Sheet, Section III.

   - Draw examples on the chalkboard, and relate the formula to the examples.

4. Have the students apply the formula for calculating volume; use Information Sheet, Section IV.

   - Have students complete Assignment Sheet #3; go over answers in class.

   - Have students complete Assignment Sheet #4; go over answers in class.

F. Give test.

G. Critique test and discuss in class.

H. Reteach and retest as necessary.

III. Unit reference — Spann, Margaret. *Related Vocational Math*. Stillwater, Oklahoma: State Department of Vocational and Technical Education/Curriculum and Instructional Materials Center, 1972.

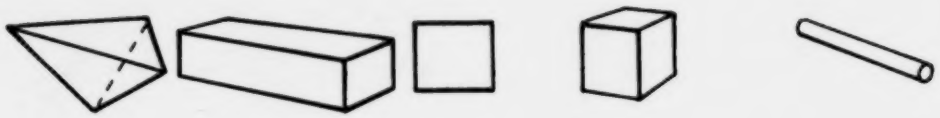
VOLUME
UNIT V

PRETEST

NAME _____ SCORE _____

1. Identify the cube or cubic unit by circling the picture of it.

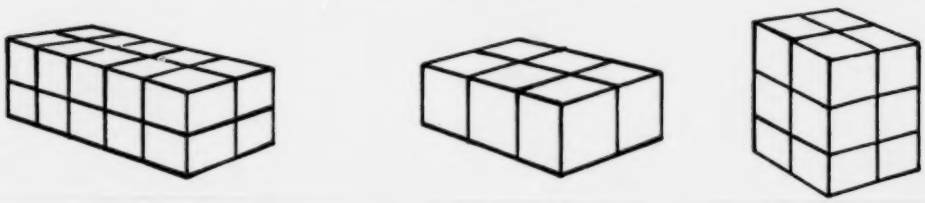
a. b. c. d. e.



2. Determine the volumes of the following figures by counting the cubic units. Write the correct answers in the blanks.

a. _____cubic units b. _____cubic units c. _____cubic units

d. _____cubic units e. _____cubic units f. _____cubic units

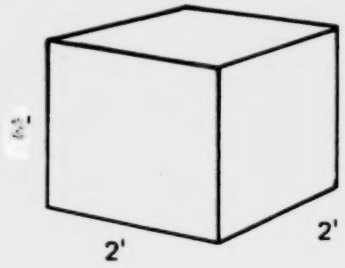


3. Write the formula for finding the volume of a rectangular solid.

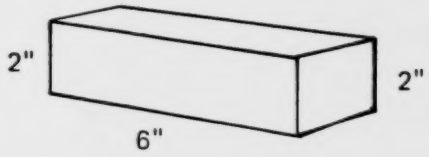
PRETEST

4. Apply the formula for volume by calculating the volume of each of the following figures. Write the correct answers in the blanks.

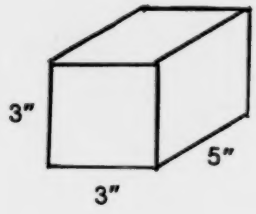
a. _____



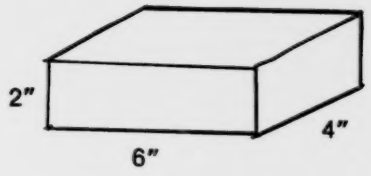
b. _____



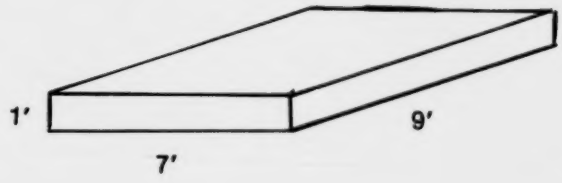
c. _____



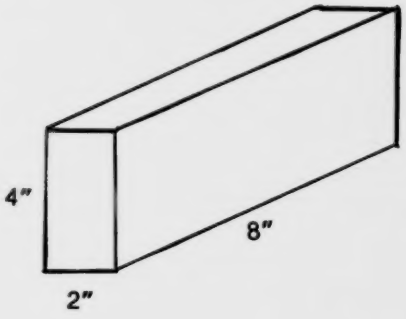
d. _____



e. _____



f. _____



VOLUME
UNIT V

ANSWERS TO PRETEST

1. d

2. a. 12
   b. 5
   c. 24
   d. 20
   e. 6
   f. 12

3. V = LWH

4. a. 8 cubic feet
   b. 24 cubic inches
   c. 45 cubic inches
   d. 48 cubic inches
   e. 63 cubic feet
   f. 64 cubic inches

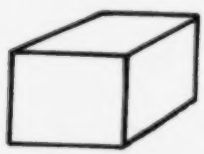
VOLUME
UNIT V

INFORMATION SHEET

I. Cubic unit — Figure made up of six equal square sides; used to measure volume

(NOTE: Volume is the measurement of space occupied by a three-dimensional figure—one with length, width, and height.)

FIGURE 1



II. Determining volume by counting cubic units

A. Count the cubic units in the top layer

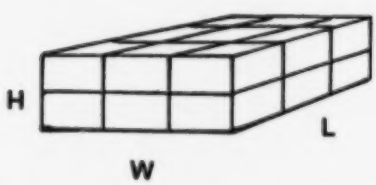
(NOTE: In the following example, the top layer has 9 cubic units.)

B. Multiply by the number of layers to find the volume

(NOTE: There are 2 layers in the example, so 2 × 9 = 18 cubic units of volume.)

EXAMPLE:

FIGURE 2



INFORMATION SHEET

III. Formula for volume — Volume = Length x Width x Height *or* V = LWH

IV. Calculating volume

A. Write the formula for volume

B. Substitute the numbers for length, width, and height

C. Multiply to find the volume

EXAMPLE: Find the volume of a rectangular figure where L = 10", W = 8", H = 3".

V = LWH
V = 10 x 8 x 3
V = 240 cubic feet

(NOTE: Volume measurement is expressed in cubic units.)

VOLUME
UNIT V

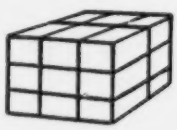
ASSIGNMENT SHEET #1 — DETERMINE VOLUME BY COUNTING CUBIC UNITS

NAME _____ SCORE _____

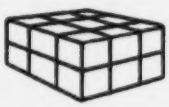
Directions: Record the dimensions and volume for the figures in this chart.

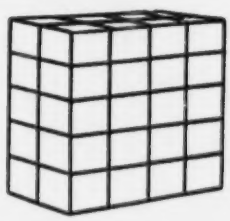
(NOTE: Volume is the number of cubic units.)

	Height = H	Width = W	Length = L	Volume = V
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

1. 

2.

3. 

4. 

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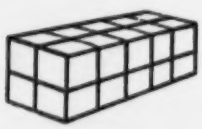
6. 

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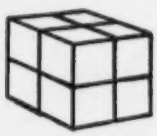
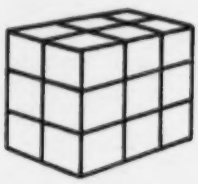
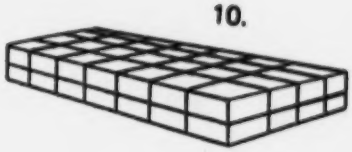
8. 

9. 

10. 

VOLUME
UNIT V

ASSIGNMENT SHEET #2 — MAKE OBSERVATIONS ABOUT CUBIC INCHES AND CUBIC FEET

NAME _____ SCORE _____

1. Answer these questions about the figure below.

   a. How many cubes are in the box? _____

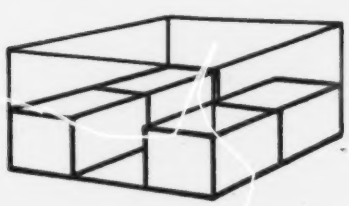
   b. How many cubes are needed to complete the bottom layer? _____

   c. How many layers can the box hold inside? _____

   d. How many cubes are needed for the top layer? _____

   e. How many cubes would there be if the box were full? _____

   f. What is the volume of the box? _____



ASSIGNMENT SHEET #2

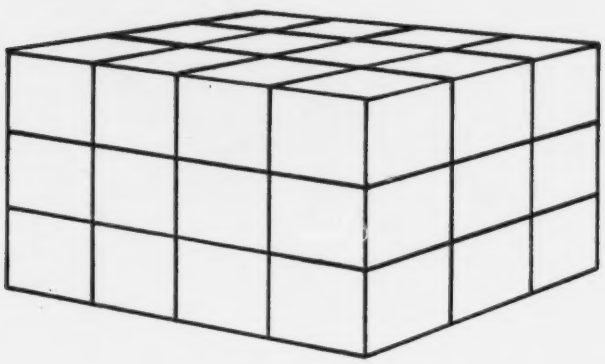
2. Answer these questions about the following figure.

   a. How many cubes in bottom layer? _____

   b. How many layers are there? _____

   c. Can you find a way to figure the volume without *counting* all the cubes one by one?

   _____



ASSIGNMENT SHEET #2

3. Answer the questions about the figure below.

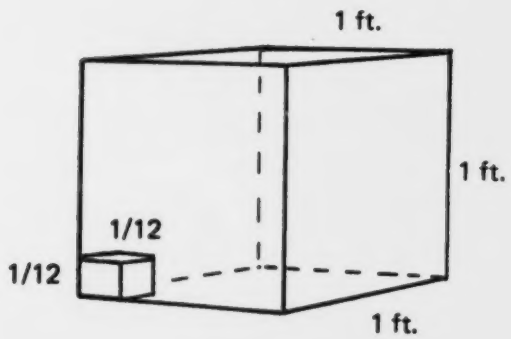
   a. How many cubic inches in 1 cubic foot? (Think of stacking cubic inches in a cubic foot box.) _____

   b. How many cubic inches would it take to fill 1 layer? _____

   c. How many cubic inches would it take to fill 2 layers? _____

   d. How many cubic inches would it take to fill 3 layers? _____

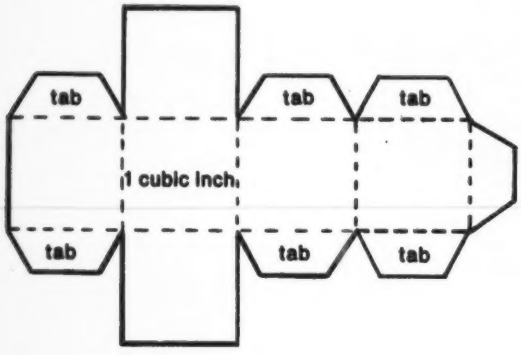
   e. How many layers would it take to fill the box? _____



ASSIGNMENT SHEET #2

4. How many cubic feet in 1 cubic yard? _____

5. Make a cubic inch.



   a. Copy pattern on cardboard. (A full-size pattern may be found on the next page.)

   b. Cut out along solid lines.

   c. Fold on dotted lines.

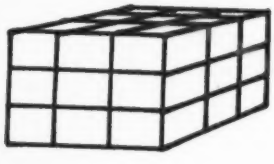
   d. Glue tabs inside to form a cube.

6. Get together with your classmates and collect all your cubic inches to complete this exercise.

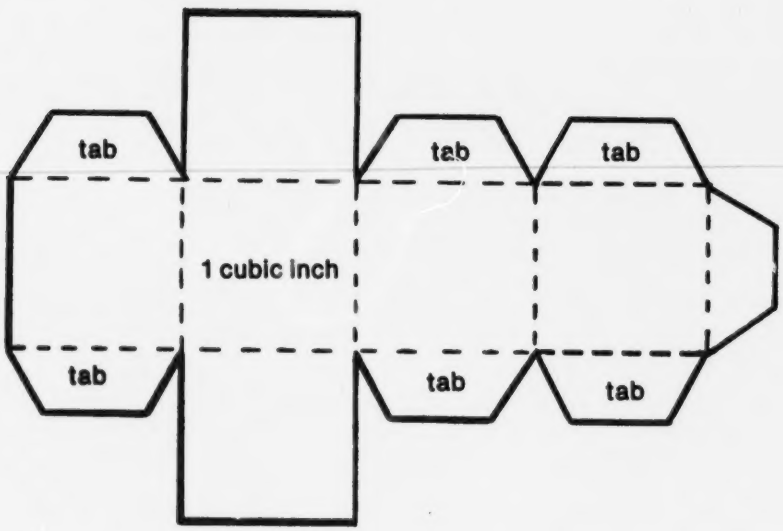
   a. Let the cubes represent cubic feet.

   b. Make a pile of cubic feet forming a cubic yard as shown below.

   c. Rearrange the blocks to make other figures filling one cubic yard of space.



ASSIGNMENT SHEET #2



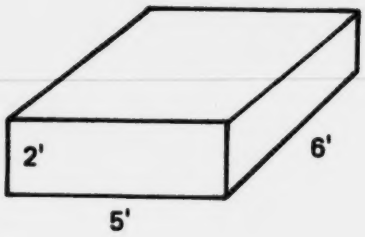
VOLUME
UNIT V

ASSIGNMENT SHEET #3 — CALCULATE VOLUME BY APPLYING FORMULA FOR VOLUME

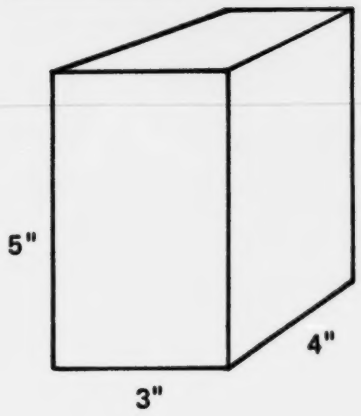
NAME _____ SCORE _____

Directions: Use the formula V = LWH to calculate the volumes of the following figures. Write the correct answers in the blanks.

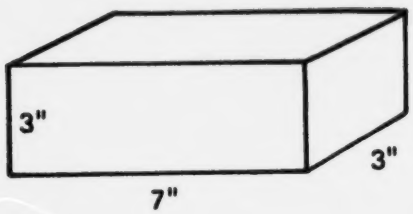
1. _____



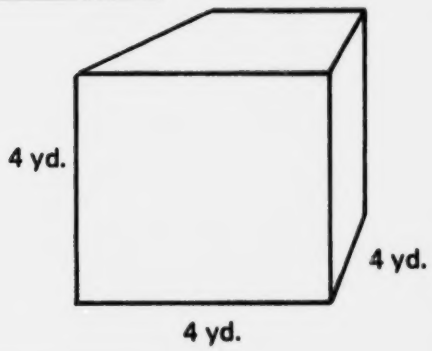
2. _____



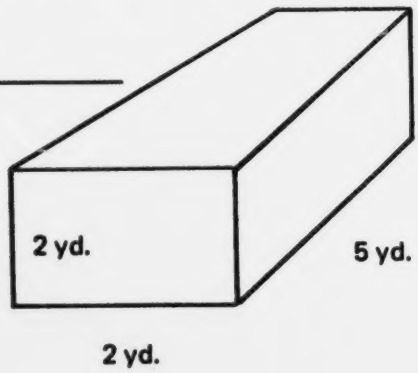
3. _____



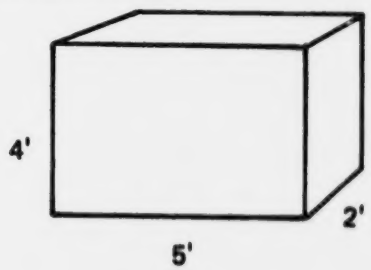
4. _____



5. _____

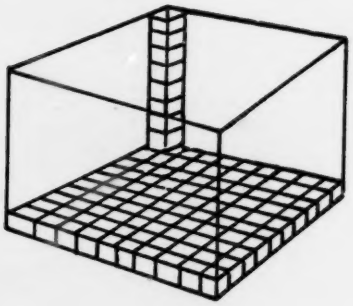


6. _____

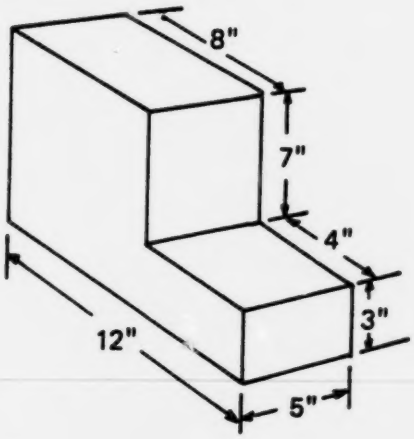


ASSIGNMENT SHEET #3

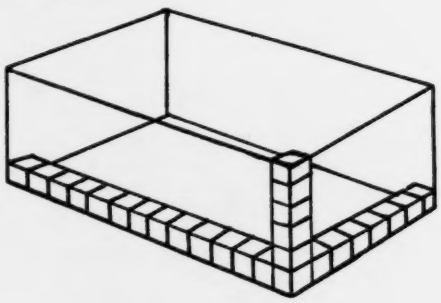
7. _____



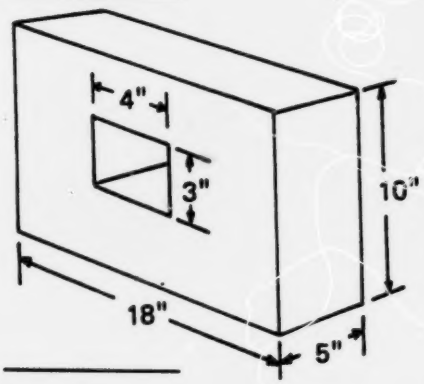
8. _____



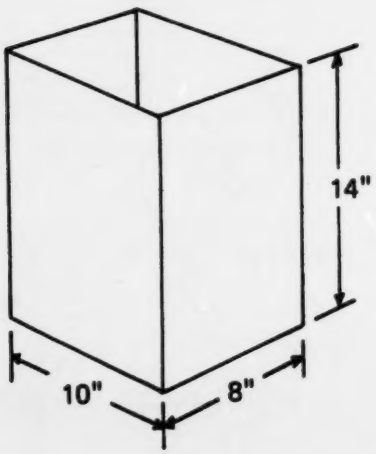
9. _____



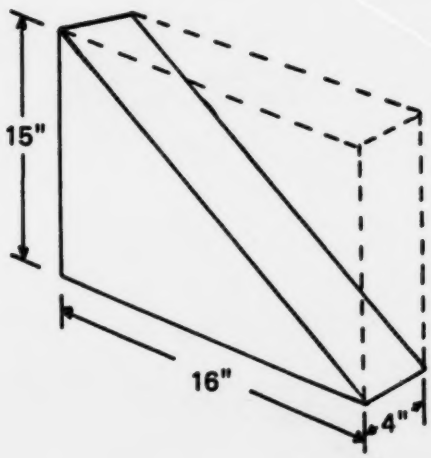
10. _____



11. _____



12. _____



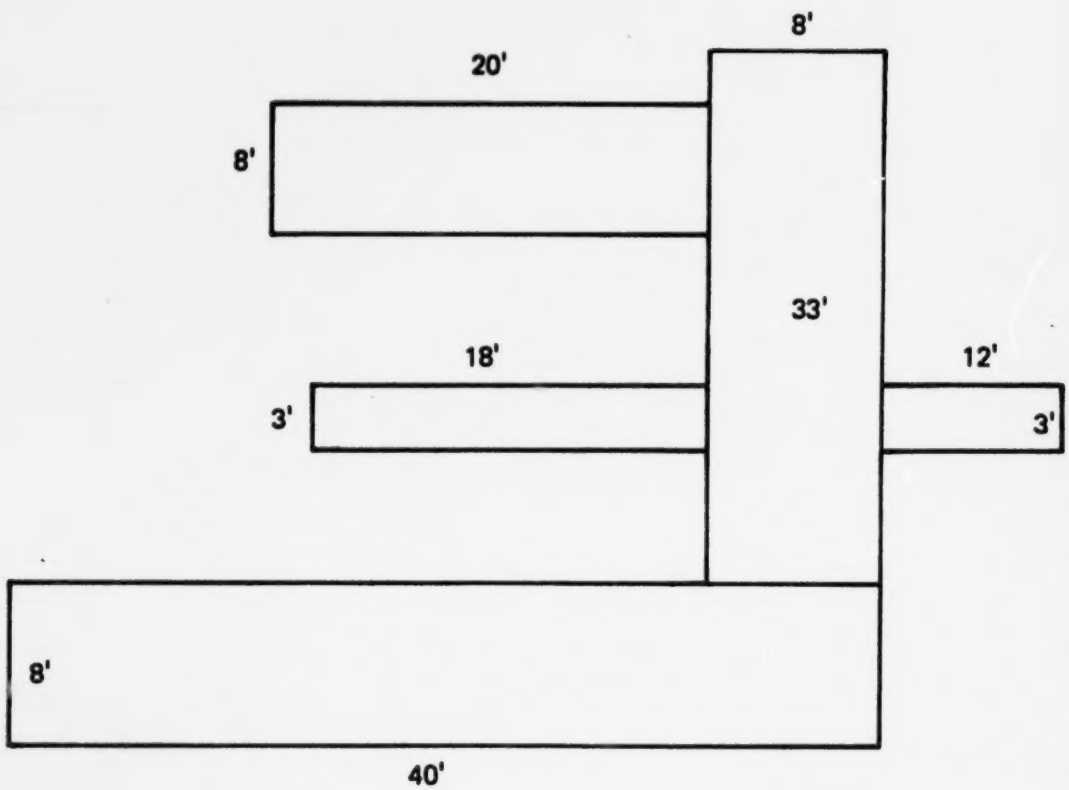
VOLUME
UNIT V

ASSIGNMENT SHEET #4 — CALCULATE VOLUME OF CONCRETE

NAME _____ SCORE _____

1. Concrete is measured by the cubic yard. If you wanted to make concrete for the following walk arrangement, how much would you have to make? The walk is to be 4" or 1/3' deep.

   Volume = _____



2. If concrete costs $14.10 per cubic yard, how much will the walks cost?

   _____

VOLUME
UNIT V

ANSWERS TO ASSIGNMENT SHEETS

Assignment Sheet #1

	H	W	L	V
1.	3	3	2	18
2.	3	3	3	27
3.	2	3	3	18
4.	5	4	2	40
5.	3	2	2	12
6.	2	5	2	20
7.	1	2	3	6
8.	2	2	2	8
9.	3	2	3	18
10.	2	4	7	56

(NOTE: Answers may be reversed in width and length columns.)

Assignment Sheet #2

1. a. 4
   b. 2
   c. 2
   d. 6
   e. 12
   f. 12 cubic units

2. a. 13
   b. 12
   c. Evaluated to the satisfaction of the instructor.

3. a. 1728
   b. 144
   c. 288
   d. 432
   e. 12

4. 27
5. Evaluated to the satisfaction of the instructor.
6. Evaluated to the satisfaction of the instructor.

Assignment Sheet #3

1. 60 cubic feet
2. 60 cubic inches
3. 63 cubic inches
4. 64 cubic yards
5. 20 cubic yards
6. 40 cubic feet
7. 900 cubic units
8. 460 cubic inches
9. 672 cubic units
10. 840 cubic inches
11. 1120 cubic inches
12. 480 cubic inches

Assignment Sheet #4

1. 278 cubic feet or 10.3 cubic yards
2. $145.23

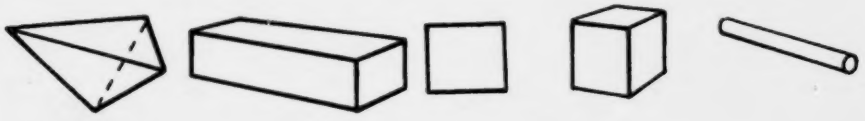
VOLUME
UNIT V

TEST

NAME _____ SCORE _____

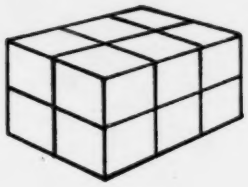
1. Identify the cube or cubic unit by circling the picture of it.

a. b. c. d. e.

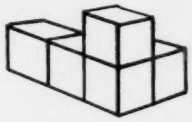


2. Calculate the volumes of these figures by counting the cubic units. Write the correct answers in the blanks.

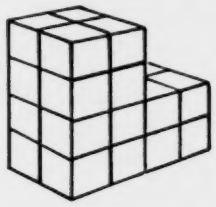
a. ____cubic units



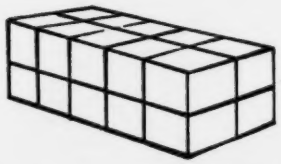
b. ____cubic units



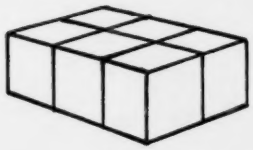
c. ____cubic units



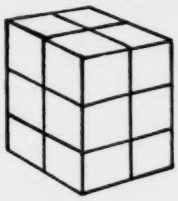
d. ____cubic units



e. ____cubic units



f. ____cubic units

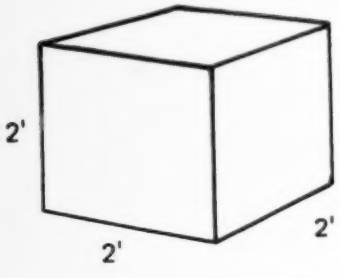


3. Write the formula for finding the volume of a rectangular solid.

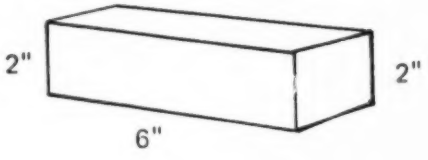
TEST

4. Apply the formula for volume by calculating the volume of each of the following figures. Write the correct answers in the blanks.

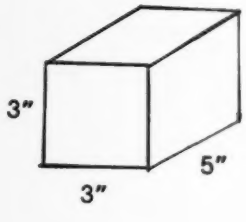
a. _____



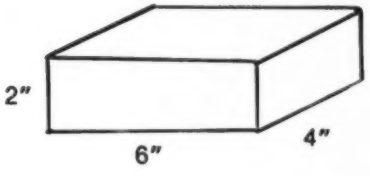
b. _____



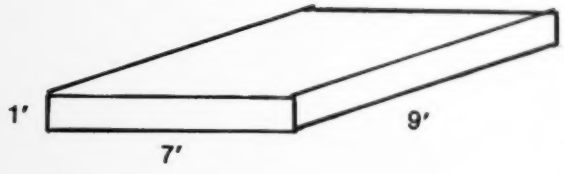
c. _____



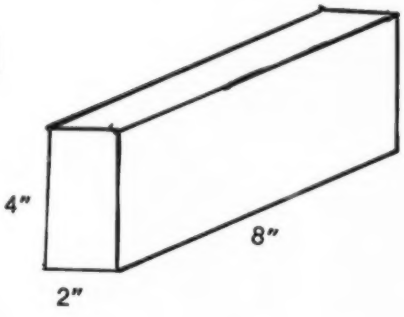
d. _____



e. _____



f. _____



VOLUME
UNIT V

ANSWERS TO TEST

1. d

2. a. 12
   b. 5
   c. 24
   d. 20
   e. 6
   f. 12

3. V = LWH

4. a. 8 cubic feet
   b. 24 cubic inches
   c. 45 cubic inches
   d. 48 cubic inches
   e. 63 cubic feet
   f. 64 cubic inches

GEOMETRIC ANGLES
UNIT VI

UNIT OBJECTIVE

After completing this unit, the student should be able to match terms and definitions related to angles, and with a protractor, measure and draw angles between 0°and 180°. This knowledge will be evidenced by completing assignment sheets and unit test with a minimum score of 85 percent.

SPECIFIC OBJECTIVES

After completing this unit, the student should be able to

1. Match terms and definitions related to angles.
2. Define specific types of angles.
3. Measure different angles within 3°, using a protractor.
4. Draw different angles within 3°, using a protractor.

GEOMETRIC ANGLES
UNIT VI

SUGGESTED ACTIVITIES

I. Unit contents

A. Objective sheet

B. Suggested activities

C. Pretest

D. Answers to pretest

E. Information sheet

F. Assignment sheets

1. Assignment Sheet #1 — Measure Angles

2. Assignment Sheet #2 — Draw Angles

G. Answers to assignment sheets

H. Test

I. Answers to test

II. Instructor's guide

A. Order (or obtain) materials to supplement unit.

B. Give pretest.

C. Critique pretest and go over results in class.

(NOTE: Be sure to take up pretests after discussing them in class. Students who score 85 percent or higher on the pretest do not need to study this unit.)

D. Discuss unit and specific objectives.

- Explain that students will learn how to measure and draw angles between 0° and 180°; they will also learn how to use a protractor.

E. Discuss information and assignment sheets.

1. Review terms and definitions relevant to angles using Information Sheet, Section I.

SUGGESTED ACTIVITIES

2. Discuss specific types of angles using Information Sheet, Section II.
   - Draw angles on the board, and label them.
3. Discuss how to measure an angle; use Information Sheet, Section III.
   - Have students complete Assignment Sheet #1; go over answers in class.
4. Explain how to draw angles; use Information Sheet, Section IV.
   - Have students complete Assignment Sheet #2.

F. Give test.

G. Critique test and discuss in class.

H. Reteach and retest as necessary.

III. Unit reference — Spann, Margaret. *Related Vocational Math*. Stillwater, Oklahoma: State Department of Vocational and Technical Education/Curriculum and Instructional Materials Center, 1972.

GEOMETRIC ANGLES
UNIT VI

PRETEST

NAME _____ SCORE _____

1. Match the correct term to each of these definitions. Write the correct numbers in the blanks.

_____a.	An instrument used to measure angles	1. Angle
_____b.	A figure formed by two rays which have the same endpoint	2. Degree
_____c.	A part of a line which has one endpoint and extends indefinitely in one direction	3. Protractor
_____d.	The common endpoint of the two rays forming an angle	4. Ray
_____e.	The unit of measure for angles	5. Vertex

2. Define the following types of angles.

a. Acute — _____

_____

b. Obtuse — _____

_____

c. Reflex — _____

_____

d. Right — _____

_____

e. Straight — _____

_____

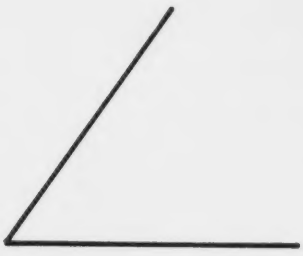
PRETEST

3. By use of a protractor, measure each of the following angles. Be accurate to within 3°. Write the correct ansers in the blanks.

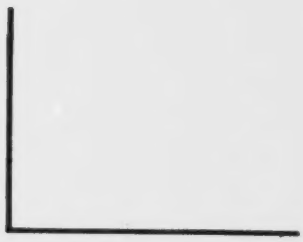
a. _____

b. _____

c. _____



d. _____



PRETEST

4. By use of a protractor, draw angles of the following sizes. Be accurate to within 3°.

   a. 25°

   b. 40°

   c. 95°

d. 145°

e. 160°

GEOMETRIC ANGLES
UNIT VI

ANSWERS TO PRETEST

1. a. 3
   b. 1
   c. 4
   d. 5
   e. 2

2. a. Acute — Angle less than 90°
   b. Obtuse — Angle greater than 90°
   c. Reflex — Angle greater than 180° and less than 360°
   d. Right — Angle of 90°
   e. Straight — Angle of 180°

3. a. 50°

   b. 120°

   c. 55°

   d. 90°

4. Evaluated to the satisfaction of the instructor.

GEOMETRIC ANGLES
UNIT VI

INFORMATION SHEET

I. Terms and definitions

A. Angle — A figure formed by two rays which have the same endpoint

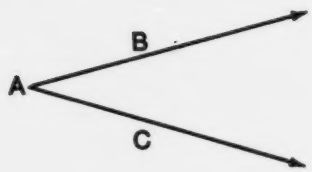
B. Ray — A part of a line which has one endpoint and extends indefinitely in one direction

C. Vertex — The common endpoint of the two rays forming an angle

(NOTE: The two rays are called sides.)

EXAMPLE: Vertex A
Side AB
Side AC

FIGURE 1

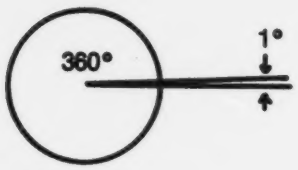


D. Degree — The unit of measure for angles

(NOTE: A degree is $\frac{1}{360}$ of a full circle.)

EXAMPLE:

FIGURE 2



E. Protractor — An instrument used to measure angles

INFORMATION SHEET

II. Specific types of angles

A. Acute — Angle less than 90°

B. Obtuse — Angle greater than 90°

C. Reflex — Angle greater than 180° and less than 360°

D. Right — Angle of 90°

E. Straight — Angle of 180°

III. Measuring angles

A. Place the protractor so that the vertex of the angle is at the arrow point on the protractor

B. Turn the protractor so that one side of the angle lies along the edge of the protractor

C. Read the point on the scale where the outer side crosses

IV. Draw an angle

A. Draw a line (ray) which will be one side of the angle

B. Place the protractor so that the arrow point on the protractor is on the endpoint of the line, and so that the line lies along the edge of the protractor

C. Find the desired number of degrees on the protractor scale

D. Without moving the protractor, place a mark on the paper at that point

E. Now remove the protractor and connect the mark and the endpoint of the first line with a straight line

GEOMETRIC ANGLES
UNIT VI

ASSIGNMENT SHEET #1 — MEASURE ANGLES

NAME _____ SCORE _____

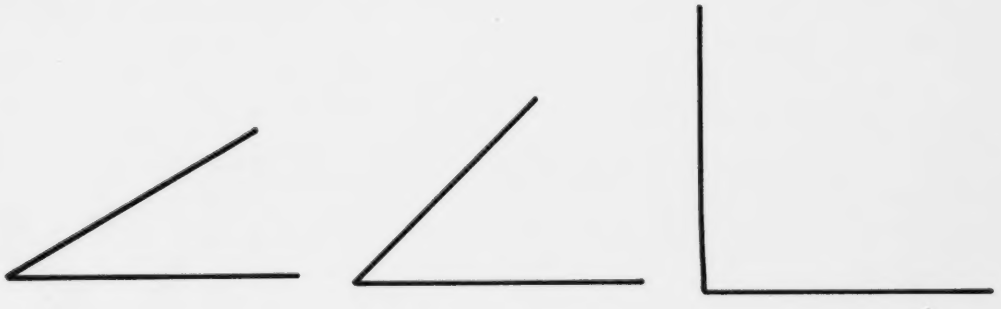
1. Complete these drawings.

   a. Draw an angle and label this angle with: vertex, side, side.

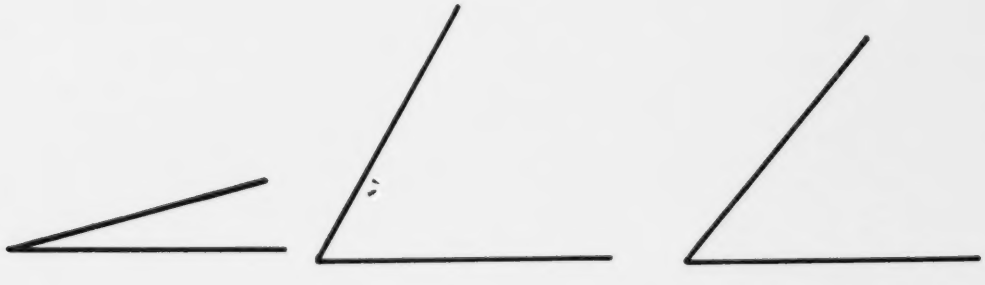
   b. Draw an angle and write the letter B at the vertex.

ASSIGNMENT SHEET #1

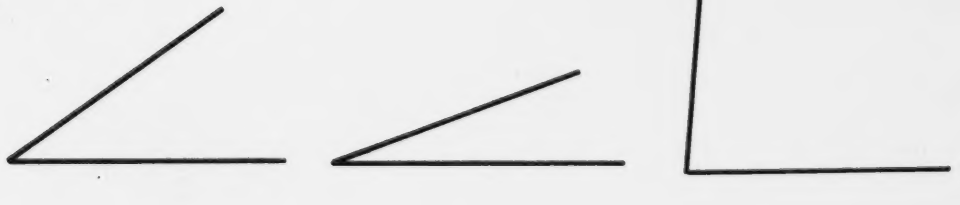
2. **Measure the following angles and state their size in degrees. You should be correct to within 3°. Label each angle by its type.**



a. _____ b. _____ c. _____

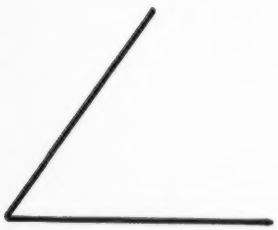


d. _____ e. _____ f. _____

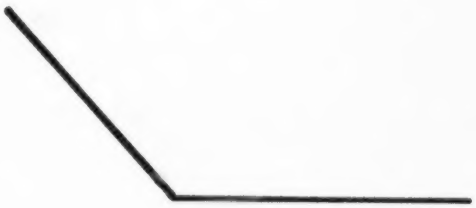


g. _____ h. _____ i. _____

ASSIGNMENT SHEET #1



j. _____



k. _____

l. _____

GEOMETRIC ANGLES
UNIT VI

ASSIGNMENT SHEET #2 — DRAW ANGLES

NAME _____ SCORE _____

Draw angles of the following sizes. You should be correct to within 3°.

1. 90°

2. 60°

3. 30°

ASSIGNMENT SHEET #2

4. 45°

5. 20°

6. 15°

ASSIGNMENT SHEET #2

7. 7°

8. 87°

9. 62°

ASSIGNMENT SHEET #2

10. 50°

11. 140°

12. 150°

ASSIGNMENT SHEET #2

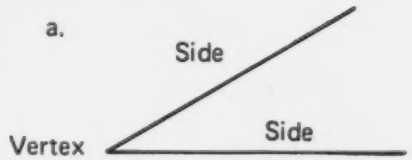
13. 180°

GEOMETRIC ANGLES
UNIT VI

ANSWERS TO ASSIGNMENT SHEETS

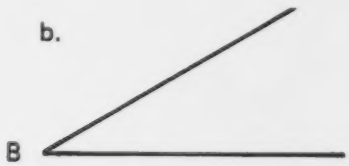
Assignment Sheet #1

1. a.



(NOTE: Size of angles may vary.)

b.



2. a. 30° acute
   b. 45° acute
   c. 90° right
   d. 15° acute
   e. 60° acute
   f. 50° acute
   g. 35° acute
   h. 20° acute
   i. 85° acute
   j. 55° acute
   k. 132° obtuse
   l. 180° straight

Assignment Sheet #2 — Evaluated to the satisfaction of the instructor.

GEOMETRIC ANGLES
UNIT VI

TEST

NAME _____ SCORE _____

1. Match the correct term to each of these definitions. Write the correct numbers in the blanks.

_____a.	An instrument used to measure angles	1. Angle
_____b.	A figure formed by two rays which have the same endpoint	2. Degree
_____c.	A part of a line which has one endpoint and extends indefinitely in one direction	3. Protractor
_____d.	The common endpoint of the two rays forming an angle	4. Ray
_____e.	The unit of measure for angles	5. Vertex

2. Define the following angles.

a. Acute — _____

_____

b. Obtuse — _____

_____

c. Reflex — _____

_____

d. Right — _____

_____

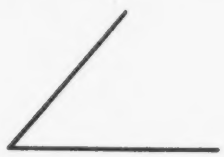
e. Straight — _____

_____

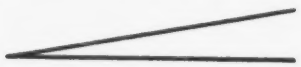
TEST

3. By use of a protractor, measure each of the following angles. Be accurate to within 3°. Write the correct answers in the blanks.

a. _____



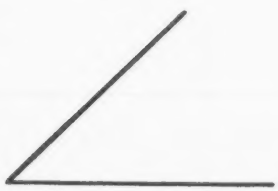
b. _____



c. _____

d. _____

e. _____



TEST

4. By use of a protractor, draw angles of the following sizes. Be accurate to within 3°.

   a. 30°

   b. 60°

TEST

c. 90°

d. 45°

TEST

e. 120°

REVIEWING GEOMETRY
UNIT VII

UNIT OBJECTIVE

After completing this unit, the student will be able to identify geometric figures; calculate perimeters for rectangles, squares, and triangles; calculate area of six straight-sided figures; calculate circumference and area of circles; calculate the volume of figures; and draw and measure angles. This knowledge will be evidenced by completing assignment sheets and unit test with a minimum score of 85 percent.

SPECIFIC OBJECTIVES

After completing this unit, the student should be able to

1. Identify shapes of different types of geometric figures.
2. Calculate the perimeters for rectangles, squares, and triangles.
3. Calculate the areas of straight-sided geometric figures.
4. Solve problems involving the area of a circle.
5. Solve problems involving the circumference of a circle.
6. Apply the formula for volume by calculating the volumes of figures.
7. Measure different angles within 3°, using a protractor.
8. Draw different angles within 3°, using a protractor.

GEOMETRIC ANGLES
UNIT VI

ANSWERS TO TEST

1. a. 3
   b. 1
   c. 4
   d. 5
   e. 2

2. a. Acute — Angle less than 90°
   b. Obtuse — Angle greater than 90°
   c. Reflex — Angle greater than 180° and less than 360°
   d. Right — Angle of 90°
   e. Straight — Angle of 180°

3. a. 50°
   b. 10°
   c. 120°
   d. 160°
   e. 45°

4. Evaluated to the satisfaction of the instructor.

REVIEWING GEOMETRY
UNIT VII

SUGGESTED ACTIVITIES

I. Unit contents

A. Objective sheet

B. Suggested activities

C. Information sheet

D. Assignment sheets

1. Assignment Sheet #1 — Identify Shapes of Geometric Figures
2. Assignment Sheet #2 — Calculate Perimeters
3. Assignment Sheet #3 — Calculate Areas
4. Assignment Sheet #4 — Solve for Area of Circles
5. Assignment Sheet #5 — Solve for Circumference of Circles
6. Assignment Sheet #6 — Calculate Volume
7. Assignment Sheet #7 — Measure Angles
8. Assignment Sheet #8 — Draw Angles

E. Answers to assignment sheets

F. Test

G. Answers to test

II. Instructor's guide

A. Order (or obtain) materials to supplement unit.

B. Discuss unit and specific objectives.

C. Discuss information and assignment sheets.

1. Review shapes of geometric figures using Information Sheet, Section I.

- Have students complete Assignment Sheet #1.
- Go over answers in class.

SUGGESTED ACTIVITIES

2. Review calculating the perimeters of rectangles, squares, and triangles; use Information Sheet, Section II.
   - Have students complete Assignment Sheet #2.
   - Go over answers in class.
3. Review calculating the areas of straight-sided geometric figures; use Information Sheet, Section III.
   - Have students complete Assignment Sheet #3.
   - Go over answers in class.
4. Review solving problems involving the area of circles using Information Sheet, Section IV.
   - Have students complete Assignment Sheet #4.
   - Go over answers in class.
5. Review solving problems involving the circumference of circles using Information Sheet, Section V.
   - Have students complete Assignment Sheet #5.
   - Go over answers in class.
6. Review how to apply the formula for volume by calculating the volume of figures; use Information Sheet, Section VI.
   - Have students complete Assignment Sheet #6.
   - Go over answers in class.
7. Review measuring angles within 3° using a protractor; use Information Sheet, Section VII.
   - Have students complete Assignment Sheet #7.
   - Go over answers in class.
8. Review drawing different angles within 3° using a protractor; use Information Sheet, Section VIII.
   - Have students complete Assignment Sheet #8.
   - Go over answers in class.

D. Give test.

E. Critique test and discuss in class.

SUGGESTED ACTIVITIES

F. Reteach and retest as necessary.

III. Unit reference — Spann, Margaret. *Related Vocational Math*. Stillwater, Oklahoma: State Department of Vocational and Technical Education/Curriculum and Instructional Materials Center, 1972.

REVIEWING GEOMETRY
UNIT VII

INFORMATION SHEET

I. Shapes of geometric figures

A. Square

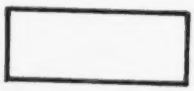
FIGURE 1

B. Rhombus

FIGURE 2

C. Rectangle

FIGURE 3



D. Trapezoid

FIGURE 4

E. Triangle

FIGURE 5

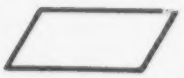
INFORMATION SHEET

F. Circle

FIGURE 6

G. Parallelogram

FIGURE 7

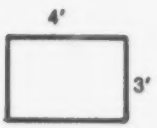


II. Calculating perimeters

A. Rectangle — Perimeter = 2 × Length + 2 × Width *or* P = 2L + 2W

EXAMPLE: Calculate the perimeter of a 3-foot by 4-foot rectangle.

FIGURE 8



P = 2L + 2W
P = (2 × 4) + (2 × 3)
P = 8 + 6
P = 14'

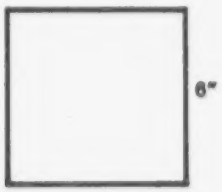
(NOTE: Label the answer with the correct measure.)

INFORMATION SHEET

B. Square — Perimeter = 4 x Length of Side *or* P = 4S

EXAMPLE: Calculate the perimeter of a square with 6-inch sides.

FIGURE 9

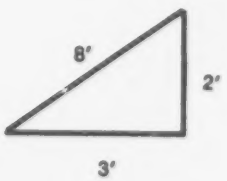


P = 4S
P = 4 x 6
P = 24"

C. Triangle — Perimeter = Length of Side One + Length of Side 2 + Length of Side 3 *or* $P = S_1 + S_2 + S_3$

EXAMPLE: Calculate the perimeter of a triangle with 8-foot, 3-foot, and 2-foot sides.

FIGURE 10



$P = S_1 + S_2 + S_3$
P = 2 + 3 + 8
P = 13'

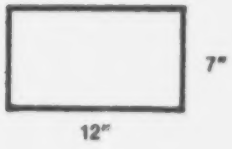
INFORMATION SHEET

III. Calculating the areas of straight-sided geometric figures

A. Parallelogram — Area = Base × Height *or* A = BH

EXAMPLE: Calculate the area of a parallelogram with a 12-inch base and 7-inch height.

FIGURE 11



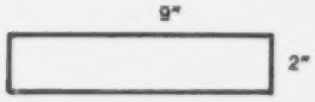
A = BH
A = 12" × 7"
A = 84 square inches

(NOTE: Area measures are labeled with square units of measure.)

B. Rectangle — Area = Length × Width *or* A = LW

EXAMPLE: Calculate the area of a rectangle with a length of 9 inches and a width of 2 inches.

FIGURE 12



A = LW
A = 9 × 2
A = 18 square inches

INFORMATION SHEET

C. Square — Area = Length of Side × Length of Side *or* $A = S^2$

EXAMPLE: Calculate the area of a square with 10-foot sides.

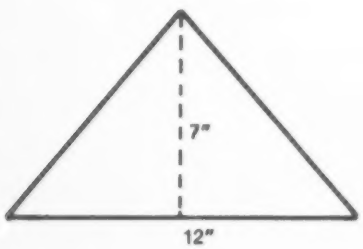
FIGURE 13

$A = S^2$
$A = 10 \times 10$
$A = 100$ square feet

D. Triangle — Area = ½ × Base × Height *or* $A = \frac{1}{2}$ BH

EXAMPLE: Calculate the area of a triangle with a height of 7 inches and a 12-inch base.

FIGURE 14



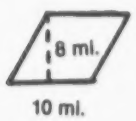
$A = \frac{1}{2}$ BH
$A = \frac{1}{2} \times 12 \times 7$
$A = 6 \times 7$
$A = 42$ square inches

INFORMATION SHEET

E. Rhombus — Area = Base × Height *or* A = BH

EXAMPLE: Calculate the area of a rhombus with a 10-mile base and an 8-mile height.

FIGURE 15

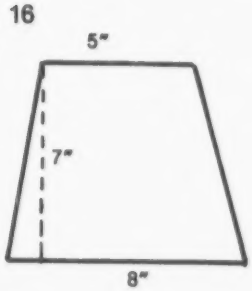


A = BH
A = 10 × 8
A = 80 square miles

F. Trapezoid — Area = ½ Height ($Base_1$ + $Base_2$) *or* ½ H (B_1 + B_2)

EXAMPLE: Calculate the area of a trapezoid with a 7-inch height and 5-inch and 8-inch bases.

FIGURE 16



A = ½ H (B_1 + B_2)
A = (½ × 7) (8 + 5)
A = (7/2) (13)
A = 7/2 × 13/1
A = 91/2
A = 45½ square inches

INFORMATION SHEET

IV. Solving for the area of a circle — Area = π × Radius × Radius *or* A = πR^2

EXAMPLE: Calculate the area of a trapezoid with a 7-inch height and 5-inch and 8-inch bases.

(NOTE: PI[π] = 3.14)

EXAMPLE: Calculate the area of a circle with a radius of 5 inches.

$A = \pi R^2$
$A = 3.14 \times 5 \times 5$
A = 78.50 square inches

V. Solving for circumference of a circle — Circumference = π × Diameter *or* $C = \pi D$

EXAMPLE: Calculate the circumference of a circle with a 12-inch radius.

$C = \pi D$
$C = 3.14 \times 24$
C = 75.36 inches

(NOTE: Circumference is a measure of length and the labels on the answers will be measure of length.)

VI. Calculating volume — Volume = Length × Width × Height *or* V = LWH

EXAMPLE: Calculate the volume of a figure 10 feet long, 8 feet wide and 3 feet high.

V = LWH
$V = 10 \times 8 \times 3$
V = 240 cubic feet

(NOTE: The label for volume measure is cubic units of measure.)

VII. Measuring angles

A. Place the protractor so that the vertex of the angle is at the arrow point on the protractor

B. Turn the protractor so that one side of the angle lies along the edge of the protractor

C. Read the point on the scale where the other side crosses

VIII. Drawing angles

A. Draw a line (ray) which will be one side of the angle

INFORMATION SHEET

B. Place the protractor so that the arrow point on the protractor is on the endpoint of the line, and so that the line lies along the edge of the protractor

C. Find the desired number of degrees on the protractor scale

D. Without moving the protractor, place a mark on the paper at that point

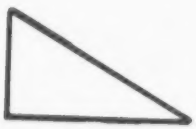
E. Now remove the protractor and connect the mark and the endpoint of the first line with a straight line

REVIEWING GEOMETRY
UNIT VII

ASSIGNMENT SHEET #1 — IDENTIFY SHAPES OF GEOMETRIC FIGURES

NAME _____ SCORE _____

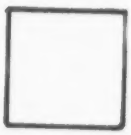
In the space provided beside each figure, write the correct name of the geometric figure.

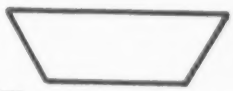
1. _____ 

2. _____

3. _____

4. _____

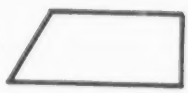
5. _____ 

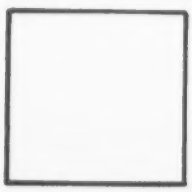
6. _____ 

7. _____

8. _____

9. _____

10. _____ 

11. _____ 

12. _____

REVIEWING GEOMETRY
UNIT VII

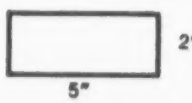
ASSIGNMENT SHEET #2 — CALCULATE PERIMETERS

NAME _____ SCORE _____

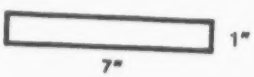
Directions: Calculate the perimeter for each of the following geometric shapes. Write the formula for each problem.

1. Rectangles

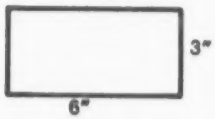
a. _____



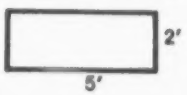
b. _____



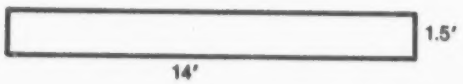
c. _____



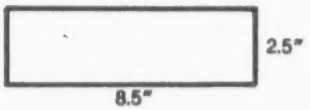
d. _____



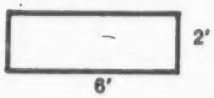
e. _____



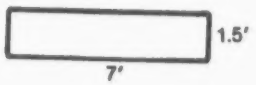
f. _____



g. _____



h. _____



i. L = 13", W = 4"

j. L = 15", W = 3"

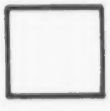
k. L = 4', W = 1.5'

l. L = 2.5", W = 1.25"

ASSIGNMENT SHEET #2

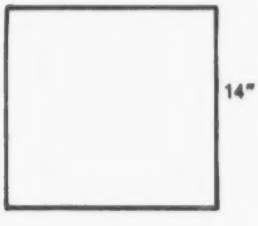
2. Squares

a. _____

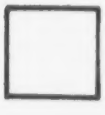


b. _____

c. _____

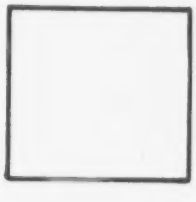


d. _____



e. _____

f. _____



g. S = 9'

h. S = 3.5'

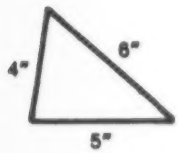
i. S = 12"

j. S = 5½"

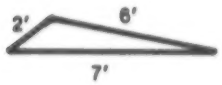
ASSIGNMENT SHEET #2

3. Triangles

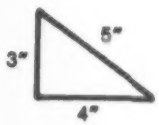
a. _____



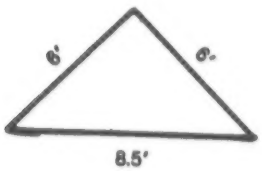
b. _____



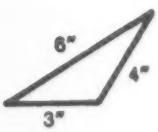
c. _____



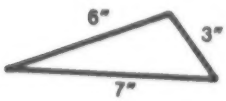
d. _____



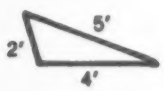
e. _____



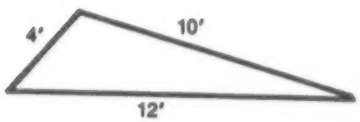
f. _____



g. _____



h. _____



ASSIGNMENT SHEET #2

i. $S_1 = 3.5'$, $S_2 = 2.5'$, $S_3 = 6'$

j. $S_1 = 4''$, $S_2 = 8''$, $S_3 = 3''$

k. $S_1 = 4\frac{1}{4}''$, $S_2 = 6\frac{1}{3}''$, $S_3 = 7''$

l. $S_1 = 5\frac{1}{8}''$, $S_2 = 4\frac{1}{4}''$, $S_3 = 6''$

REVIEWING GEOMETRY
UNIT VII

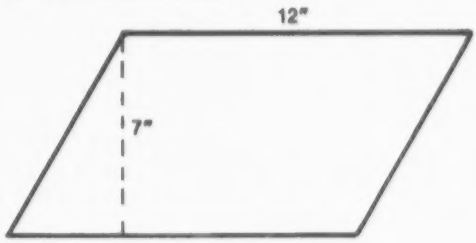
ASSIGNMENT SHEET #3 — CALCULATE AREAS

NAME _____ SCORE _____

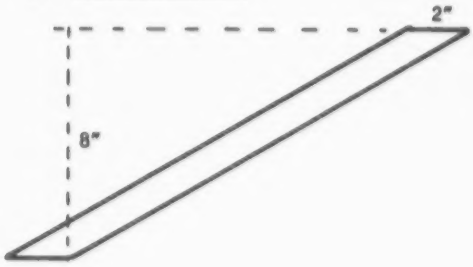
Calculate the area for each of the following geometric figures; write the formula for each problem.

1. Parallelograms

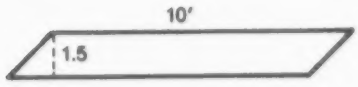
a. _____



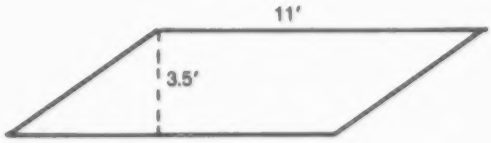
b. _____



c. _____



d. _____



e. B = 4.5 inches, H = 3.33 inches.

ASSIGNMENT SHEET #3

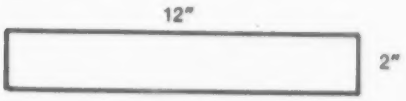
f. B = 5", H = 5.5 inches.

g. B = 4.25', H = 8.5'

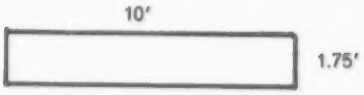
h. B = 12⅓", H = 14"

2. Rectangles

a. _____



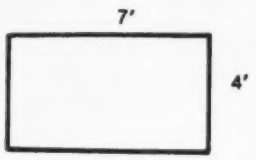
b. _____



ASSIGNMENT SHEET #3

c. _____

d. _____



e. L = 4.7 yds, W = 2.0 yds.

f. L = 12½', W = 7¼'

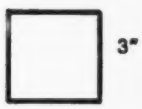
g. L = 14.5 miles, W = 8.8 miles

ASSIGNMENT SHEET #3

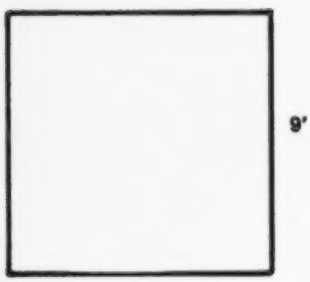
h. L = 3.33", W = 4.2"

3. Squares

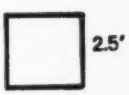
a. _____



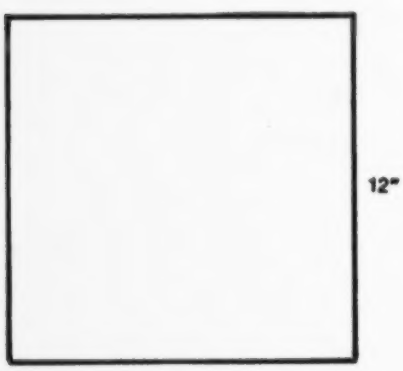
b. _____



c. _____



d. _____



e. S = 12½ miles

ASSIGNMENT SHEET #3

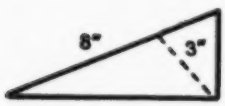
f. S = 14.5 miles

g. S = $7\frac{2}{3}'$

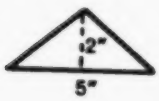
h. S = 11.8"

4. Triangles

a. _____



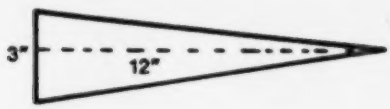
b. _____



ASSIGNMENT SHEET #3

c. _____

d. _____



e. B = 12", H = 3.5"

f. B = 11.5', H = 9'

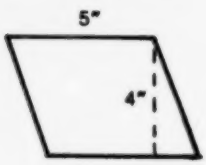
g. B = .75', H = .5'

ASSIGNMENT SHEET #3

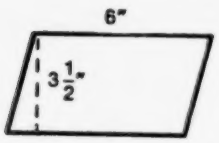
h. B = 2.3 yds., H = 3.0 yds.

5. Rhombuses

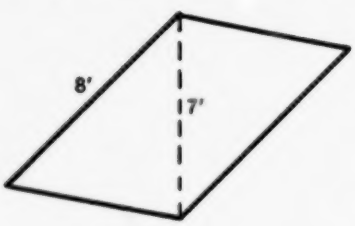
a. _____



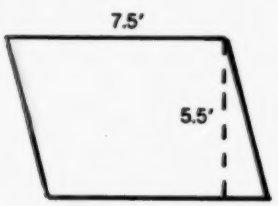
b. _____



c. _____



d. _____



e. B = 4.4', H = 4.75'

ASSIGNMENT SHEET #3

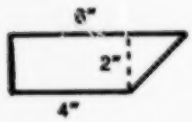
f. B = 15", H = 12.33"

g. B = 4.3', H = 1.75'

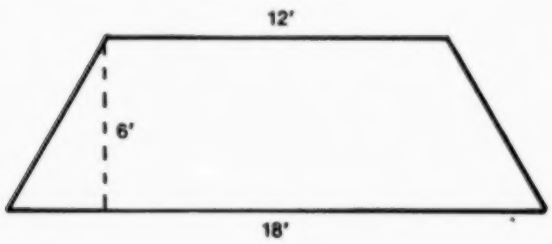
h. B = 25½ miles, H = 15 ⅔ miles

6. Trapezoids

a. _____

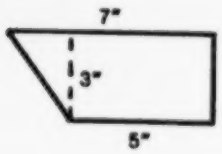


b. _____

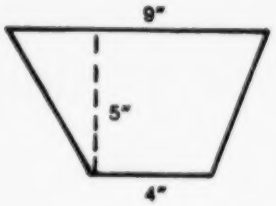


ASSIGNMENT SHEET #3

c. _____



d. _____



e. $H = 7"$, $B_1 = 5"$, $B_2 = 8"$

f. $H = 14'$, $B_1 = 12.3'$, $B_2 = 15.5'$

g. $H = 2.25"$, $B_1 = 3.3"$, $B_2 = 2.3"$

ASSIGNMENT SHEET #3

h. $H = 5.5$ miles, $B_1 = 4.6$ miles, $B_2 = 3.75$ miles

REVIEWING GEOMETRY
UNIT VII

ASSIGNMENT SHEET #4 — SOLVE FOR AREA OF CIRCLES

NAME _____ SCORE _____

1. Solve for the areas of circles with the following dimensions. (Use $\pi = 3.14$)

   a. Radius 4 inches

   b. Diameter 21 feet

   c. Radius 12 feet

ASSIGNMENT SHEET #4

d. Diameter 14 inches

e. Diameter 15.4 inches

f. Radius 24 inches

ASSIGNMENT SHEET #4

g. Radius 12 miles

h. Diameter 14.5 yards

i. Radius 5 inches

ASSIGNMENT SHEET #4

j. Diameter 16 inches

k. Radius 6 yards

l. Diameter 24 yards

ASSIGNMENT SHEET #4

2. Solve the following story problems.

   a. Find the area of a circle that has a diameter of 11 feet.

   b. The radius of a circular swimming pool is 13 feet. Find the area.

   c. The diameter of a breather lid is 13.5 inches. What is the area?

ASSIGNMENT SHEET #4

d. The radius of a circular walk around a flower garden is 24 feet. What is the area of the garden and walk?

e. The diameter of a circular table measures 42 inches. What is its area?

f. A horse is tied to a stake with a 14 ft. rope. How much area may the horse graze?

REVIEWING GEOMETRY
UNIT VII

ASSIGNMENT SHEET #5 — SOLVE FOR CIRCUMFERENCE OF CIRCLES

NAME _____ SCORE _____

1. Solve for the circumferences of circles with the following dimensions. (Use $\pi = 3.14$)

   a. Radius 4 inches

   b. Diameter 21 feet

   c. Radius 12 feet

   d. Diameter 14 inches

ASSIGNMENT SHEET #5

e. Diameter 15.4 inches

f. Radius 24 inches

g. Radius 12 miles

h. Diameter 14.5 yards

ASSIGNMENT SHEET #5

i. Radius 5 inches

j. Diameter 16 inches

k. Radius 6 yards

l. Diameter 24 yards

ASSIGNMENT SHEET #5

2. Solve the following story problems.

   a. Find the circumference of a circle that has a diameter of 11 feet.

   b. The radius of a circular swimming pool is 13 feet. Find the circumference.

   c. The diameter of a breather lid is 13.5 inches. What is the circumference?

   d. The radius of a circular walk around a flower garden is 24 feet. What is the circumference of the garden and walk?

ASSIGNMENT SHEET #5

e. The diameter of a circular table measures 42 inches. What is its circumference?

f. A horse is tied to a stake with a 14 ft. rope. What is the circumference of the area the horse may graze?

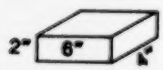
REVIEWING GEOMETRY
UNIT VII

ASSIGNMENT SHEET #6 — CALCULATE VOLUME

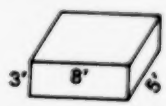
NAME _____ SCORE _____

Use the formula V = LWH to calculate the volumes of the following figures.

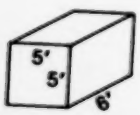
1. _____



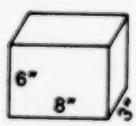
2. _____



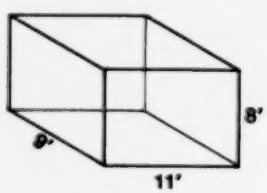
3. _____



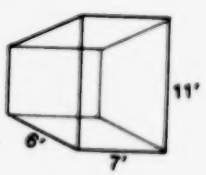
4. _____



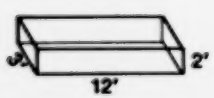
5. _____



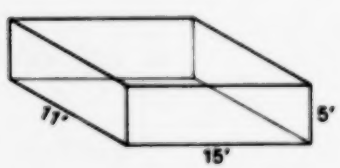
6. _____



7. _____

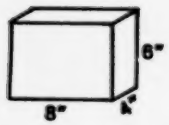


8. _____

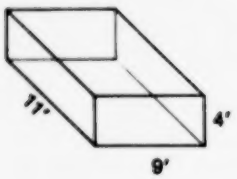


ASSIGNMENT SHEET #6

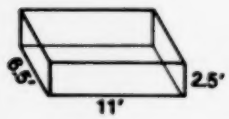
9. _____



10. _____



11. _____



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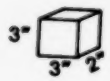
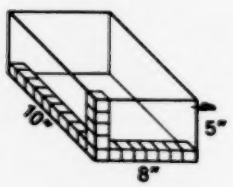


13. _____

14. _____



REVIEWING GEOMETRY
UNIT VII

ASSIGNMENT SHEET #7 — MEASURES ANGLES

NAME _____ SCORE _____

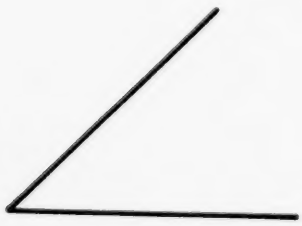
Measure the following angles and state their size in degrees. You should be correct to within 3°.

1. _____

2. _____

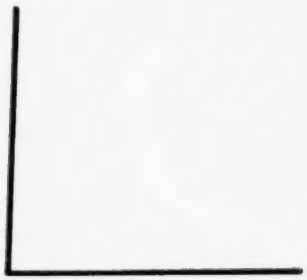
3. _____

4. _____



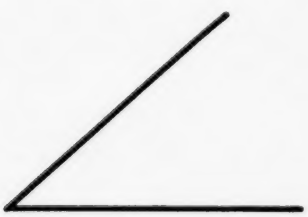
ASSIGNMENT SHEET #7

5. _____

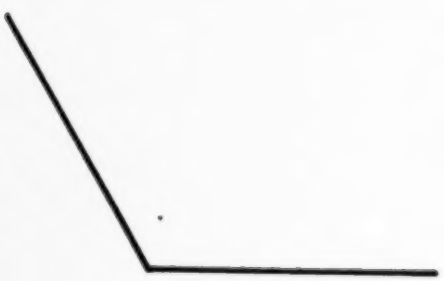


6. _____

7. _____

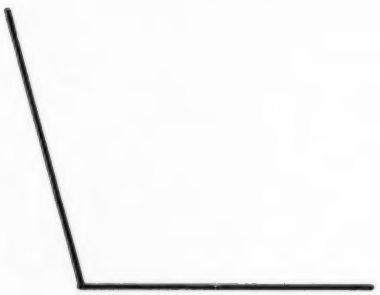


8. _____



ASSIGNMENT SHEET #7

9. _____



10. _____

11. _____

12. _____

13. _____

14. _____

REVIEWING GEOMETRY
UNIT VII

ASSIGNMENT SHEET #8 — DRAW ANGLES

NAME _____ SCORE _____

Draw angles of the following sizes. You should be correct to within 3°.

1. 90°

2. 40°

3. 180°

4. 60°

ASSIGNMENT SHEET #8

5. 160°

6. 145°

7. 15°

8. 75°

ASSIGNMENT SHEET #8

9. 25°

10. 30°

11. 77°

12. 8°

ASSIGNMENT SHEET #8

13. 58°

14. 114°

REVIEWING GEOMETRY
UNIT VII

ANSWERS TO ASSIGNMENT SHEETS

Assignment Sheet #1

1. Triangle
2. Circle
3. Parallelogram
4. Rhombus
5. Square
6. Trapezoid
7. Rectangle
8. Triangle
9. Parallelogram
10. Trapezoid
11. Square
12. Parallelogram

Assignment Sheet #2

1. Rectangles (P = 2L + 2W)
   a. 14"
   b. 16"
   c. 18"
   d. 14'
   e. 31'
   f. 22"
   g. 16'
   h. 17'
   i. 34"
   j. 36"
   k. 11'
   l. 7.5"

2. Squares (P = 4S)
   a. 24"
   b. 8"
   c. 56"
   d. 24'
   e. 10'
   f. 48'
   g. 36'
   h. 14'
   i. 48"
   j. 22"

ANSWERS TO ASSIGNMENT SHEETS

3. Triangles ($P = S_1 + S_2 + S_3$)
   a. 15″
   b. 15′
   c. 12″
   d. 20.5′
   e. 13″
   f. 16″
   g. 11′
   h. 26′
   i. 12′
   j. 15″
   k. 17.58″ or $17\frac{7}{12}$″
   l. 15.38″ or $15\frac{3}{8}$″

Assignment Sheet #3

1. Parallelograms ($A = BH$)
   a. 84 square inches
   b. 16 square inches
   c. 15 square feet
   d. 38.5 square feet
   e. 14.985 square inches
   f. 27.5 square inches
   g. 36.125 square feet
   h. 172.62 square feet

2. Rectangles ($A = LW$)
   a. 24 square inches
   b. 17.5 square feet
   c. 18 square inches
   d. 28 square feet
   e. 9.4 square yards
   f. 90.625 square feet
   g. 127.6 square miles
   h. 13.986 square inches

3. Squares ($A = S_2$)
   a. 9 square inches
   b. 81 square feet
   c. 6.25 square feet
   d. 144 square inches
   e. 156.25 square miles
   f. 210.25 square miles
   g. 58.6756 square feet
   h. 139.24 square inches

ANSWERS TO ASSIGNMENT SHEETS

4. Triangles ($A = \frac{1}{2}BH$)
   a. 12 square inches
   b. 5 square inches
   c. 6 square inches
   d. 18 square inches
   e. 21 square inches
   f. 51.75 square feet
   g. 0.1875 square feet
   h. 3.45 square yards

5. Rhombuses ($A = BH$)
   a. 20 square inches
   b. 21 square inches
   c. 56 square feet
   d. 41.25 square feet
   e. 20.9 square feet
   f. 184.95 square inches
   g. 7.525 square feet
   h. 399.483 square miles

6. Trapezoids ($A = \frac{1}{2}H [B_1 + B_1]$
   a. 10 square inches
   b. 90 square feet
   c. 18 square inches
   d. 32.5 square inches
   e. 45.5 square inches
   f. 194.6 square feet
   g. 6.3 square inches
   h. 22.9625 square miles

Assignment Sheet #4

1. a. 50.24 square inches
   b. 346.29 square feet
   c. 452.16 square feet
   d. 153.86 square inches
   e. 186.17 square inches
   f. 1808.64 square inches
   g. 452.16 square miles
   h. 165.05 square yards
   i. 78.5 square inches
   j. 200.96 square inches
   k. 113.04 square yards
   l. 452.16 square yards

ANSWERS TO ASSIGNMENT SHEETS

2. a. 94.99 square feet
   b. 530.66 square feet
   c. 143.07 square inches
   d. 1808.64 square feet
   e. 1384.74 square inches
   f. 615.44 square feet

Assignment Sheet #5

1. a. 25.12 in.
   b. 65.94 ft.
   c. 75.36 ft.
   d. 43.96 in.
   e. 48.36 in.
   f. 150.72 in.
   g. 75.36 miles
   h. 45.53 yds.
   i. 31.4 in.
   j. 50.24 in.
   k. 37.68 yds.
   l. 75.36 yds.

2. a. 34.54 ft.
   b. 81.64 ft.
   c. 42.39 in.
   d. 150.72 ft.
   e. 131.88 in.
   f. 87.92 ft.

Assignment Sheet #6

1. 48 cubic in.
2. 120 cubic ft.
3. 150 cubic ft.
4. 144 cubic in.
5. 792 cubic ft.
6. 462 cubic ft.
7. 72 cubic ft.
8. 825 cubic ft.
9. 192 cubic in.
10. 396 cubic ft.
11. 178.75 cubic ft.
12. 18 cubic in.
13. 780 cubic in.
14. 400 cubic in.

ANSWERS TO ASSIGNMENT SHEETS

Assignment Sheet #7

1. 25°
2. 90°
3. 60°
4. 45°
5. 88°
6. 116°
7. 42°
8. 120°
9. 105°
10. 180°
11. 136°
12. 150°
13. 142°
14. 30°

Assignment Sheet #8 — Evaluated to the satisfaction of the instructor.

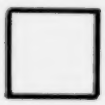
REVIEWING GEOMETRY
UNIT VII

TEST

NAME _____ SCORE _____

1. Identify the following types of geometric figures.

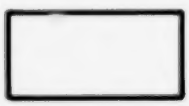
a. _____



b. _____

c. _____

d. _____

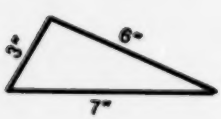


e. _____

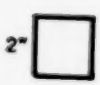
f. _____

2. Calculate the perimeters of the following rectangles, squares, and triangles. Write the formula for each one.

a. _____

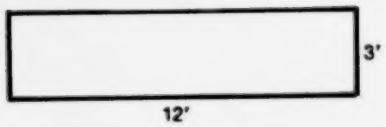


b. _____

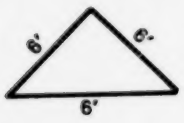


TEST

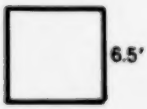
c. _____



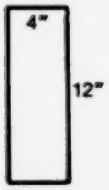
d. _____



e. _____

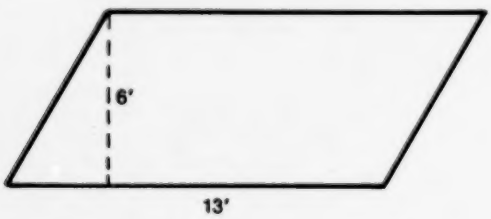


f. _____

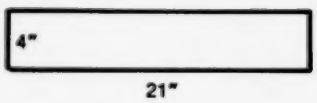


3. Calculate the areas of the following straight-sided figures.

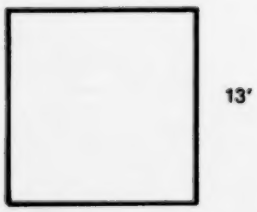
a. _____



b. _____



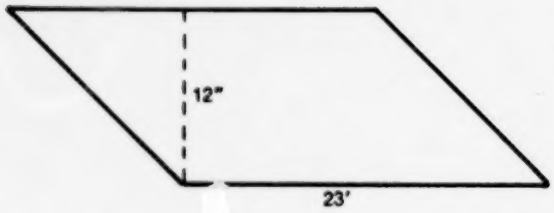
c. _____



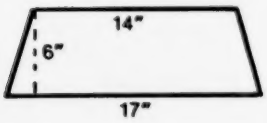
d. _____

TEST

e. _____

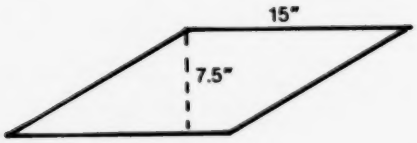


f. _____



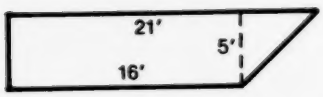
g. _____

h. _____



i. _____

j. _____



k. _____

l. _____

TEST

4. Solve the following problems involving the area of circles. (Use $\pi = 3.14$).

   a. Diameter 4 ft.

   b. Radius 22 feet

   c. Radius 3.5 inches

   d. Diameter 4.5 yards

   e. Diameter 15 inches

   f. Radius 12 yards

5. Solve the following problems involving the circumference of circles. (Use $\pi = 3.14$).

   a. Diameter 4 ft.

   b. Radius 22 feet

   c. Radius 3.5 inches

   d. Diameter 4.5 yards

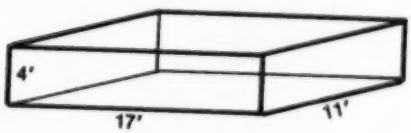
TEST

e. Diameter 15 inches

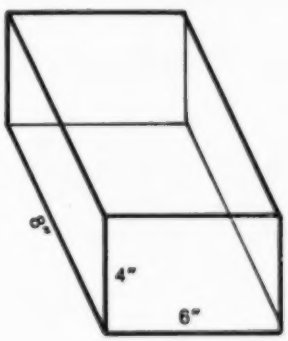
f. Radius 12 yards

6. Apply the formula for volume by calculating the volumes of the following figures.

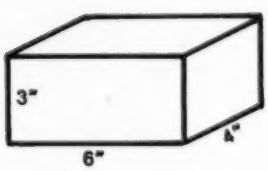
a. _____



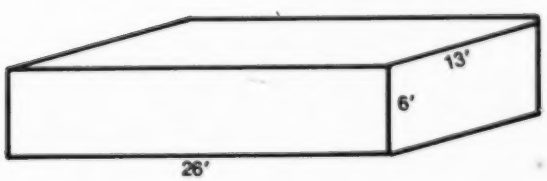
b. _____



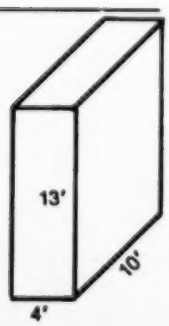
c. _____



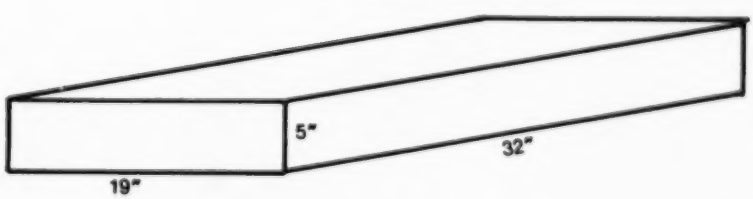
d. _____



e. _____



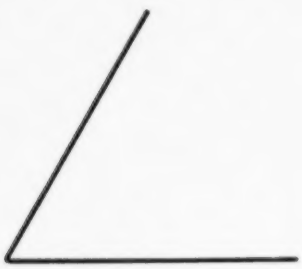
f. _____



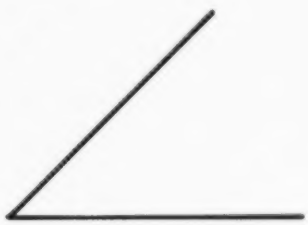
TEST

7. Measure the following angles within 3°. Use a protractor.

a. _____



b. _____



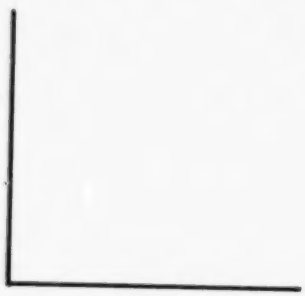
c. _____

d. _____

TEST

e. _____

f. _____



8. Draw angles of the following measurements within 3°. Use a protractor.

a. 33°

b. 118°

TEST

c. 45°

d. 134°

e. 92°

f. 67°

REVIEWING GEOMETRY
UNIT VII

ANSWERS TO TEST

1. a. Square
   b. Circle
   c. Triangle
   d. Rectangle
   e. Parallelogram or rhombus
   f. Trapezoid

2. a. $(P = S_1 + S_2 + S_3)$ 16″
   b. $(P = 4S)$ 8″
   c. $(P = 2L + 2W)$ 30′
   d. $P = (S_1 + S_2 + S_3)$ 18′
   e. $(P = 4S)$ 26′
   f. $(P = 2L + 2W)$ 32″

3. a. 78 square feet
   b. 84 square inches
   c. 169 square feet
   d. 64 square inches
   e. 276 square feet
   f. 93 square inches
   g. 34.5 square inches
   h. 112.5 square inches
   i. 165 square inches
   j. 92.5 square feet
   k. 121 square inches
   l. 32 square inches

4. a. 12.56 square feet
   b. 1519.76 square feet
   c. 38.465 square inches
   d. 15.896 square yards
   e. 176.625 square inches
   f. 452.16 square yards

5. a. 12.56 ft.
   b. 138.16 ft.
   c. 21.98 in.
   d. 14.13 yds.
   e. 47.1 in.
   f. 75.36 yds.

ANSWERS TO TEST

6. a. 748 cubic feet
   b. 192 cubic inches
   c. 72 cubic inches
   d. 2028 cubic feet
   e. 520 cubic feet
   f. 3040 cubic inches

7. a. 60°
   b. 45°
   c. 86°
   d. 120°
   e. 114°
   f. 90°

8. Evaluated to the satisfaction of the instructor.